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COMMONWEALTH BUREAU OF ANIMAL HEALTH

THE

VETERINARY BULLETIN

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DISEASES CAUSED BY BACTERIA AND FUNGI

HINDSON, J. C. (1956). **ACTH in the treatment of acute induration of the bovine udder.**—*Vet. Rec.* **68,** 732-733. **1324**

In 20 cows with mostly staphylococcal mastitis adrenocorticotrophic hormone was used, in a dosage of 100 i.u., followed by 50 i.u. 48 hours later, as an adjuvant to local and systemic antibiotic therapy. In all except 3 of the cases the inflammation of the quarter largely disappeared within a few days of the cessation of treatment, and induration did not occur.

—G. P. MARSHALL.

MONDINI, S. & QUAGLIO, G. L. (1956). Su di un particolare aspetto della stafilococcosi dei polli: la cosiddetta "gangrena dell'ala". **[Wing-tip gangrene, an avian staphylococcal infection.]**—*Zooprofilassi.* **11,** 677-681. **1325**

An account of a widespread generalized infection of fowls with *Staph. aureus,* mainly penicillin-resistant strains, and occasionally with *Pseudomonas pyocyanea,* also resistant to antibiotics. Subcutaneous lesions are found in the neck, round the eyes, the back, thighs, claws and interdigital spaces, and characteristically on the wings. Miliary nodules are found in the liver and spleen. It is believed that the disease occurs under poor hygienic conditions and that various skin conditions, such as fowl pox, offer a portal of entry for the causal organisms.—I. W. JENNINGS.

THROOP, B. T., SWANSON, E. W. & MUNDT, J. O. (1957). **The efficiency of the Hotis test in the identification of streptococcic infections of the udder.**—*Amer. J. vet. Res.* **18,** 93-96. [Authors' summary modified.] **1326**

The Hotis test was found to be an excellent method of detecting *Streptococcus agalactiae* infection in a herd, and was of some value in detecting *Str. uberis* infection. However, owing to the large number of negative and suspicious reactions and to the nature of the infection, it was not considered a good method for the detection of mastitis caused by the latter organism. *Str. dysgalactiae* and *Str. uberis* were found to be the most frequent causes of udder infections in 3 herds which were free from *Str. agalactiae.*

PETRILLO, R. L. (1956). L'associazione cloroamfenicolo-streptomicina nella terapia della mastite streptococcica. **[Chloramphenicol-streptomycin therapy in bovine streptococcal mastitis.]**—*Gazz. Vet., Milano.* No. 2. pp. 1-7. [English and French summaries.] **1327**

A solution for intramammary infusion, containing chloramphenicol and streptomycin in different proportions, was used in 59 quarters infected with *Str. agalactiae.* Clinically these fell into 3 groups:— (a) 22 had not had previous drug treatment, (b) 27 had failed to respond to one or two treatments with other drugs, (c) 10 were refractory to three or more such treatments. The following were cured in the 3 groups:— (a) 9 out of 12 treated twice with chloramphenicol 60 mg. + streptomycin 30 mg.; and 8 out of 10 given a single infusion of 120 mg. and 60 mg. respectively; (b) 8 out of 11 treated twice at the lower, and 12 out of 16 treated once at the higher dosage; (c) 6 of the 10 refractory quarters after a single infusion at the higher dosage.—G. P. MARSHALL.

FOLEY, E. J. (1957). **Response of udders to various products used in treatment of bovine mastitis.**—*N. Amer. Vet.* **38,** 14-16, Refs. p. 13. [Author's summary slightly modified.] **1328**

Experiments are described which show that certain products commonly used for the treatment of bovine mastitis incite inflammation when instilled into normal or infected udders. These results are compared with those obtained when the anti-inflammatory steroid prednisone acetate is instilled in a dispersing vehicle containing penicillin and streptomycin. With this product inflammation in infected quarters is

promptly checked, thus inducing favourable conditions for the therapeutic action of the antibiotics.

SWARTLING, P. & PETERSSON, I. (1957). Mastitbekämpningsmedlet Hibitane. [**Chlorhexidine for the control of mastitis.**]—*Medlemsbl. Sver. VetFörb.* **9**, 25-26 & 28. [In Swedish.] **1329**

Milk from cows treated for mastitis with "Hibitane" (active principle *p*-dichlor-diphenyldiguanido hexane) was unsuitable for cheese manufacture for at least the first two days after treatment. The day after treatment, the active principle was present in the milk in concentrations up to about 1:5,000 and the milk had therefore to be diluted 500–1,000 times with normal milk to prevent inhibition of the souring process with consequent spoilage of the cheese. On the second day after treatment, concentrations of the drug in the milk varied up to about 1:100,000. As the use of "Hibitane" is unrestricted, owners of treated cows should be warned to withhold the milk from such cows until at least the third day after treatment. If it must be delivered to the dairies it should be in special, labelled containers.—F.E.W.

PHILLIPS, G. B., JEMSKI, J. V. & BRANT, H. G. (1956). **Cross infection among animals challenged with** *Bacillus anthracis*. — *J. infect. Dis.* **99**, 222-226. [Authors' summary modified.] **1330**

Normal monkeys (*Macaca irus*) were placed with monkeys which had been exposed to aerosols of *B. anthracis*. The cross infection rate, measured by death from anthrax, was 10·3%. It was higher when a monkey was housed with 3 exposed animals (33·3%) than when it was housed with one (7·4%). In a similar experiment with g. pigs the cross infection rate was 4·9%. Again it was higher when a g. pig was housed with 3 exposed animals (8·7%) than when it was housed with one (1·4%). Among the exposed animals 45·3% of the monkeys and 21·1% of the g. pigs died from anthrax. Cross infection from g. pigs intraperitoneally inoculated with *B. anthracis* did not occur even when as many as 10 inoculated g. pigs were placed with a healthy one. Aerosols of *B. anthracis* in decreasing amounts were detected in the ventilated cages of the monkeys for 9 days after exposure, but not in the open cages containing i/p injected g. pigs. *B. anthracis* could be recovered from the head, thorax, faeces and saliva of exposed monkeys and their cage-mates for 4 days after exposure. It was concluded that cross infection occurred through inhalation of secondary aerosol. The influence of such aerosol on the reliability of results from experimental infections and its danger to experimenters are pointed out.

CARTER, G. B. & MARSDEN, N. V. B. (1956). **A method of perfusion-fixation in the histopathological investigation of the guinea-pig lung after exposure to clouds of the spores of** *Bacillus anthracis*.—*J. Path. Bact.* **72**, 683-686. [Authors' summary modified.] **1331**

Formol-saline fixative was introduced into the pulmonary circulation *via* the portal vein, by means of an enclosed apparatus and special cannula and trocar.

CHAPPLE, I. L. & ABRAHAMS, E. W. (1956). **Bovine phthisis in Queensland.**—*Med. J. Aust.* June 16th. 995-997. **1332**

The bovine type of tubercle bacillus was isolated from six adult people with pulmonary TB. All the patients had had direct contact with cattle and may have acquired the infection by inhalation.—D. C. BLOOD.

NASSAL, J. (1956). Humane Tuberkuloseinfektion beim Rind mit Ausscheidung der Erreger durch das unveränderte Euter. [**Infection of a cow with human-type tubercle bacilli. Excretion of the organism from the apparently normal udder.**] — *Rindertuberkulose*, **5**, 189-198. **1333**

A report of a case of aerogenic infection of an 8 year-old cow with human TB. by its owner, who was a case of open TB. Human type tubercle bacilli were isolated from the apparently normal milk. P.M. examination revealed only minor lesions of TB. in the mediastinal lymph nodes, while a careful examination of the mammary gland yielded negative results. Cultural tests in g. pigs with material from the affected lymph nodes were positive.

It is suggested that bovine type tubercle bacilli might also be excreted from the apparently healthy udder. N. drew attention to the possible danger of infection of TB.-free herds by tuberculous attendants and farmers.

—F. K. LEEB.

ZURECK, F. (1956). Ist die Komplementbindungsreaktion bei der Untersuchung von Milchproben auf Tuberkulose noch von Wert? [**Value of the complement fixation test in examining milk samples for TB.**]—*Rindertuberkulose*. **5**, 232-240. **1334**

In Berlin, where the TB.-Eradication Scheme has not yet been put into operation, the complement-fixation test has proved a useful method for the serological testing of milk. The

haemagglutination-haemolysis reaction was used additionally to distinguish positive results obtained by the c.f. test. The practical value of this method in milk testing is demonstrated by the steady decrease of organisms found in tested milk samples.—F. K. Leeb.

Pietz, P. (1956). Die Desinfektionswirkung der Reinigungs- und Desinfektionsmittel gegenüber Mycobakt. Tuberkulosis im Tierversuch. **[Effect of certain detergents and disinfectants on *M. tuberculosis*.]**—*Milchwissenschaft.* **11**, 396-398. [English, French anl Spanish summaries.] **1335**

G. pigs were used to test the effect of a number of solid and liquid disinfectants and detergents, (P_3-extra, P_3-sterile "Clarin", "Purin", and "Facula") against *M. tuberculosis* and *M. phlei*. None of these substances proved sufficiently lethal to human and bovine types of tubercle bacillus, but they were reliable in killing *M. phlei*. To prevent the introduction of pathogenic types of mycobacteria into dairy machinery, particularly bottle cleaning machines, temperatures of at least 85° to 90°C. should be maintained.—F. K. Leeb.

Seelemann, M. & Wegener, K. H. (1957). Ein Beitrag zur Standardisierung des Einheitstuberkulins. **[Standardization of tuberculin.]** —*Dtsch. tierärztl. Wschr.* **64**, 12-15. **1336**

Four German standard tuberculins, ("Friesoythe", "Warthausen", "Hoechst" and "Asid") were tested in TB.-free and in infected animals. Differences in the size of the skin reaction varied from 0·27 to 0·349 mm. in TB.-negative animals, and from 6·008 to 7·073 mm. in positive reactors. These fluctuations were closely related to differences in the pH values of these tuberculins, which ranged from 6·04 to 7·17, the higher pH coinciding with the greatest increase in skin thickness. The authors suggested a standardization of the pH value for all four tuberculins.—F. K. Leeb.

Nottbohm, H. & Funk, G. (1956). Erfahrungen über die Abgrenzung von unspezifischen Tuberkulinreaktionen mit der Simultanprobe. **[Differentiation of non-specific tuberculin reactions with the simultaneous test.]** —*Rindertuberkulose.* **5**, 207-224. **1337**

The simultaneous test with human and avian tuberculin is suitable for the differentiation of non-specific reactions from those due to infection by *M. tuberculosis*. Ordinary tuberculin tests produced wrong results in 0·7% of the cattle examined; this margin of error could be reduced by the simultaneous method. The authors advocated the adoption of the simultaneous test for annual control testing of attested herds in districts where Johne's disease, avian TB., and dermatitis nodosa ("skin TB.") frequently give rise to non-specific reactions. —F. K. Leeb.

Seibert, F. B. & Soto-Figueroa, E. (1956). **Complement fixation by tuberculopolysaccharide.**—*Proc. Soc. exp. Biol., N. Y.* **92**, 811-814. [Authors' summary slightly modified.] **1338**

High complement-fixation titres with standard tuberculin (PPD-S) were obtained with BCG antisera which showed high precipitating antibodies to PPD-S and to tuberculo-polysaccharide. Polysaccharide fixed no complement even in these sera when incubation was carried out at 37°C. However, at 4°C. fixation did take place. When polysaccharide was mixed with PPD-S the c.f. titre was lower than that obtained with PPD-S alone, suggesting inhibition of fixation at 37°C. However, this decrease appeared to be due to fixation by polysaccharide in the first stage of the reaction, probably followed by a release of the complement to the r.b.c.-amboceptor system in the second stage.

Rittershaus, E. (1956). Die käsige Lymphknotenentzündung der Schweine. **[Caseous lymphadenitis in pigs.]**—*Rindertuberkulose.* **5**, 227-232. **1339**

A description of the gross and histo-pathological changes in the mesenteric lymph nodes of pigs with caseous lymphadenitis. Three strains of an acid-fast, rod-shaped organism were isolated, all of which differed morphologically, culturally and biologically from human, bovine, and avian tubercle bacilli. They were of low pathogenicity for fowls, rabbits, g. pigs, hamsters, white rats and mice. Further work will shortly be published. [See also *V.B.* **26**, 3685.]—F. K. Leeb.

Coster, J. F. & Manten, A. (1956). **A simple technique for the differentiation of tubercle bacilli and saprophytic mycobacteria.** — *Amer. Rev. Tuberc.* **74**, 958-960. [Authors' summary slightly modified.] **1340**

Acid-fast saprophytes are easily differentiated from tubercle bacilli by a paired growth test, made both at 24°C. and on a Löwenstein slope containing 10 μg. of isoniazid per ml. maintained at 37°C. Both cultures are incubated for 3 weeks. A strain is considered to be no tubercle bacillus if multiplication occurs at 24°C. or if growth occurs on the medium containing isoniazid, provided that the latter growth is catalase positive.

Elek, S. D. & Hilson, G. R. F. (1956). **The evolution of lepromata in the rat.**—*J. Path. Bact.* **72,** 427-437. [Authors' summary modified.] **1341**

Small inocula of rat leprosy bacilli were injected i/d or i/p into rats and the progress of the resultant lesions was observed histologically by sampling at intervals up to 16 weeks after injection. Rats inoculated i/p with leprosy bacilli killed by heat or with living *Mycobacterium phlei* were studied in the same way. Study of the development of the lesions revealed that during the first 2–3 months after inoculation neither the tissue reaction nor the presence of intracellular acid-fast bacilli can be accepted as proof of infection. Tissue reactions similar to those caused by the living pathogen were induced by killed bacilli and by the saprophytic mycobacterium; they are due to the liberation of substances shared by many mycobacteria and are not necessarily due to the metabolites of growing bacilli. Non-viable rat or human leprosy bacilli are readily ingested by tissue phagocytes and persist for very long periods in a stainable form; in the past this has been confused with actual intracellular multiplication. Multiplication of bacilli begins after 6–8 weeks, and is preceded by increase in the average bacillary length. It is suggested that if cultivation of rat leprosy bacilli in monocyte cultures is to be successful, maintenance of cultures for at least a similar period will be necessary. If suitable culture conditions could be found, macroscopic growth might (by analogy with *M. tuberculosis*) require 3 months or more for its appearance.

Jensen, M. H. (1956). **A complement-fixation test for Johne's disease in cattle.**—*Nord. VetMed.* **8,** 357-367. [In English. German and Danish summaries.] **1342**

The preparation of homologous antigens is described. Bacteria are extracted at 90°C. at pH 11·5 and the extract is precipitated at pH 4·5. Antigens for *Mycobacterium johnei, M. tuberculosis,* (bovine, human and avian types) were prepared and used in a comparative study of the c.f. test with sera from cattle affected with Johne's disease, avian TB. and bovine TB. The homologous antigen produced strong reactions in the case of Johne's disease and avian TB. In the case of bovine TB. the *M. johnei* antigen gave slightly stronger reactions than the homologous antigen.—T.E.G.R.

Taher, R. M. (1955). Contribution à l'étude du diagnostic bactériologique de la paratuberculose bovine; mise en évidence des germes par moussage en présence de corps tensio-actifs. **[Bacteriological diagnosis of Johne's disease, using surface active agents for the treatment of faeces.]**—*Thesis Paris, (Alfort).* pp. 65. **1343**

Frothing samples of faeces with a polyglycol ether gave better results in the bacteriological diagnosis of Johne's disease than frothing in the presence of gelatin, or centrifugation.—M.G.G.

Rankin, J. D. (1956). **The identification of a strain of *Mycobacterium johnei* recovered from a horse.**—*J. Path. Bact.* **72,** 689-690. [Author's summary modified.] **1344**

An acid-fast bacillus, which had been isolated by Smith [see *V.B.* **25,** 1872] from a mesenteric lymph node of a horse and was dependent on the accessory *phlei*-factor for its growth on artificial media, was identified as *M. johnei.* G. pigs, rabbits and fowls inoculated with the organism remained healthy, but calves developed Johne's disease.

Sikes, D., Neher, G. M. & Doyle, L. P. (1956). **The pathology of chronic arthritis following natural and experimental *Erysipelothrix* infection of swine.**—*Amer. J. Path.* **32,** 1241-1251. [Authors' summary modified.] **1345**

Six natural cases of chronic arthritis and 3 of acute swine erysipelas were studied. A similar arthritis developed in 2 pigs placed in contact with 2 of the pigs with acute swine erysipelas. Two of 5 pigs injected i/v with 3 ml. of a 24-hour culture of *E. rhusiopathiae* died within 5 days from acute swine erysipelas. A third developed advanced chronic polyarthritis; the other 2 resisted exposure. A chronic proliferative polyarthritis, with pannus formation, developed in experimentally infected pigs. The productive reaction was of both subchondral and marginal origin. Degenerative changes in the adrenal gland and fibrotic kidneys were found in advanced cases of chronic arthritis. The pathological changes in the joints of arthritic pigs were similar in many respects to rheumatoid arthritis in man.

Zimmerman, G. & Kludas, K.-H. (1956). Über ein Wachstumspeptid für *Erysipelothrix rhusiopathiae.* **[A growth peptide for the cultivation of *E. rhusiopathiae.*]**—*Arch. exp. VetMed.* **10,** 237-245. **1346**

"Complex B" peptide, containing the amino-acids, arginine, histidine, lysine, glycine, glutamic acid, alanine and large amounts of proline, was found to be an essential growth factor for *E. rhusiopathiae.* Growth was inhibited in synthetic culture media lacking this

peptide, but no direct relationship between antigen production and concentration of Complex B peptide in the medium could be demonstrated. Attention is drawn to future possibilities of producing synthetic culture media containing specific growth proteins in low but adequate concentrations, instead of the non-specific media used at present.—F. K. Leeb.

I. Jungk, N. K. & Murdock, F. M. (1957). **An emulsion-type erysipelas bacterin. 1. Duration of immunity in pigs vaccinated at weaning.** — *Amer. J. vet. Res.* **18,** 121-125. **1347**

II. Murdock, F. M. & Jungk, N. K. (1957). **An emulsion-type erysipelas bacterin. II. Duration of immunity following vaccination of newborn pigs.**—*Ibid.* 126-132. **1348**

I. An adsorbate swine erysipelas vaccine was prepared by the method described by Traub (1947). It was then emulsified with light mineral oil and manide mono-oleate [mannitan mono-oleate] in the proportions of 370 ml. vaccine: 590 ml. oil: 40 ml. mono-oleate. 19 susceptible pigs, aged 8 weeks, were each inoculated i/m with 5 ml. of the vaccine. They all resisted challenge by scarification with virulent *E. rhusiopathiae* 107–237 days after inoculation.

II. Thirty pigs inoculated when 4 to 14 days old with emulsified (killed) vaccine developed an immunity lasting for at least 8 months. The duration of the immunity was not affected by the simultaneous administration of swine erysipelas hyperimmune serum. Immunization with live vaccine and hyperimmune serum or with adsorbate vaccine failed to produce a practical immunity under the same conditions. Two undesirable features of the emulsified vaccine were the tendency to cause persistent local reaction and its ability to cause hypersensitivity to the proteins in the vaccine. The possible methods of overcoming these drawbacks were discussed.—R.M.

Asahi, O., Hosoda, T. & Akiyama, Y. (1957). **Studies on the mechanism of infection of the brain with *Listeria monocytogenes*.**—*Amer. J. vet. Res.* **18,** 147-157. [Authors' summary slightly modified.] **1349**

A goat inoculated with *Erysipelothrix* (*Listeria*) *monocytogenes* by conjunctival instillation, although not showing signs of infection, developed lesions along the trigeminal nerve, from the eye to the brain stem. Similar lesions were produced in rabbits by conjunctival instillation and inoculation through minute wounds in the lip, even though the animals remained asymptomatic. Encephalitis was produced in mice either by applying the organism on minute wounds in the oral or nasal mucous membranes or by feeding fish soaked with a suspension of *E. monocytogenes*. The same methods of inoculation produced typical encephalitic listeriosis in goats. The lesions were essentially the same in character and distribution as those in naturally infected animals. These results suggest that, in naturally occurring encephalitic listeriosis, the organism invades the oral or nasal mucous membranes and travels along the trigeminal nerve to the brain stem.

I. Gazaryan, V. S. & Pogosyan, L. S. (1949). **[Vaccination of cattle and buffaloes against pasteurellosis with a killed vaccine.]**—*Trud. armyan. nauchno.-issled. vet. Inst.* **6,** pp. 9-12. [In Russian.] **1350**

II. Gazaryan, V. S. & Pogosyan, L. S. (1955). **[Vaccination of cattle and buffaloes against pasteurellosis with bile-phenol-saponin vaccine.]**—*Ibid.* **8,** pp. 5-9. [In Russian.] **1351**

I. The bile-phenol-saponin haemorrhagic septicaemia vaccine developed and used in Armenia was based on the finding by Gazaryan [*Trud. armyan. nauchno-issled. vet. Inst.* **1,** (1935)] that when *Past. septica* was grown on bile broth the organisms were partly lysed, and lost their virulence while retaining immunogenic properties. The use of such a preparation was found to be dangerous owing to the presence of unlysed virulent organisms, so phenol was added to kill these. Saponin was added at the rate of 0·5–1 ml. of 3% soln. in each dose. Cattle were given two or three 10 or 20 ml. doses at intervals of 10 days. This paper reports preliminary experiments on the protection of mice, rabbits, cattle and buffaloes from infection with 1,000 lethal doses of *Past. septica* one or two months after vaccination.

II. Field use of the bile-phenol-saponin vaccine commenced in 1949 with the inoculation of 3,000 cattle and buffaloes on infected farms. On one farm haemorrhagic septicaemia killed 4 out of 200 uninoculated animals, 6 months after a batch of 200 had been vaccinated; there were no cases amongst the vaccinated. In other places there were no outbreaks amongst vaccinated cattle or the controls. 50,000 animals were vaccinated in 1951, and no losses from the disease were reported. The vaccine retained its potency for a year.—R.M.

Carter, G. R. (1957). **Studies on *Pasteurella multocida*. II. Identification of antigenic characteristics and colonial variants.**—*Amer. J. vet. Res.* **18,** 210-213. [Author's summary

slightly modified. For part I, see *V.B.* **25,** 3928.] **1352**

The colonial morphology and antigenic behaviour of variants of *Past. septica* were studied by means of obliquely transmitted light and the acriflavine test. It was proposed that the colonial variants be designated by the standard terminology, smooth, mucoid, and rough, and that the antigenic characteristics be indicated by the letters S, M, and R. A characteristic reaction was observed when freshly isolated Type D strains were examined with the acriflavine test. It was pointed out that, besides aiding in the elucidation of variation in this species, the test rapidly identifies non-immunogenic cultures and those that cannot be typed.

LAMBARDT, A. (1956). Pyocyaneus—Mastitis nach Weidetetanie. [*Pseudomonas pyocyanea* **mastitis following grass tetany.**]—*Tierärztl. Umsch.* **11,** 453-454. **1353**

An account of acute mastitis, due to infection with *Ps. pyocyanea,* in two cows that had just recovered from grass tetany; it is suggested that this condition may have weakened the resistance to *Ps. pyocyanea,* which then became pathogenic. Treatment with a Terramycin-Polymyxin B suspension, though initiated in the early stages, was unsuccessful, and the cows had to be slaughtered.—F. K. LEEB.

HUTCHINSON, S. C. (1956). *Shigella equirulis* **infection in a foal.**—*N. Z. vet. J.* **4,** 119-120. [Author's summary modified.] **1354**

Bact. viscosum equi was isolated from two foals in New Zealand. A brief account of the history, isolation, and bacteriology of one case is given.

INGRAM, P. L., LOVELL, R., WOOD, P. C., ASCHAFFENBURG, R., BARTLETT, S., KON, S. K., PALMER, J., ROY, J. H. B. & SHILLAM, K. W. G. (1956). *Bacterium coli* **antibodies in colostrum and their relation to calf survival.** — *J. Path. Bact.* **72,** 561-568. [Authors' summary modified.] **1355**

Agglutination tests on colostral wheys were made against some 150 strains of *Escherichia coli* that were associated with the death of calves from white scour infections. Of 59 colostrum-fed calves that died, 45 had received colostrum that was devoid of agglutinins against the strains associated with their death. Of 94 deaths in calves deprived of colostrum, 66 were associated with strains against which agglutinins were demonstrable in the colostrum given to contemporary calves that survived. The identity of the pathogenic strains is given. Only rarely was a strain agglutinated markedly by one colostral whey and not by another. Three strains in particular (RVC 118A, RVC 330 and RVC 95A) were usually isolated only from colostrum-fed calves that died, whereas the strains isolated from calves deprived of colostrum were more heterogeneous. However, two strains (RVC 101 and RVC 51) were isolated solely from 28 calves deprived of colostrum.

BAIER, W., KALICH, J. & TAXACHER, J. (1956). Untersuchungen über die Coli-Infektion als Sterilitätsursache beim Hund. [*Escherichia coli* **infection as a cause of sterility in the dog.**]—*Zbl. VetMed.* **3,** 792-802. [English, French and Spanish summaries. English summary modified.] **1356**

Infection with *E. coli* infection in dogs can lead to specific diseases of the genital organs. Natural infection of males and its transmission to females are described. Strains isolated from dogs and bitches were identified serologically. Healthy spermatozoa were agglutinated by toxic *E. coli* or their viability was lowered. Infections in which the parenchyma has not been injured can be controlled by antibiotics, especially aureomycin, particularly if, at the same time, the intestinal flora is safeguarded or re-established. Such infections can lead to reversible or irreversible sterility.

SMITH, H. WILLIAMS & CRABB, W. E. (1957). **The effect of the continuous administration of diets containing low levels of tetracyclines on the incidence of drug-resistant** *Bacterium coli* **in the faeces of pigs and chickens: the sensitivity of the** *Bact. coli* **to other chemotherapeutic agents.**—*Vet. Rec.* **69,** 24-30. [Authors' summary modified.] **1357**

A much higher proportion of tetracycline-resistant *Escherichia coli* was found in the faeces of pigs and fowls given diets containing low levels of tetracyclines than in the faeces of pigs and fowls living on farms where these agents had never been fed. Examination of faecal samples from pigs before and after tetracycline feeding revealed a change from a predominantly sensitive to a predominantly resistant *E. coli* faecal flora. The resistant *E. coli* persisted in herds of pigs long after tetracycline feeding had ceased. A random survey of the sensitivity of *E. coli* in the faeces of pigs, fowls and sheep to oxytetracycline, streptomycin, sulphadimidine, and chloramphenicol revealed tetracycline-resistant *E. coli* in many of the pigs. This is considered to be the result of the widespread use of pig food containing tetracyclines.

Diseases considered to be associated with *E. coli* were noted in herds of pigs to which tetra-

cyclines had been fed. *E. coli* isolated from the diseased animals were all tetracycline-resistant. These diseases were not uncommon in piglets weaned early on to a milk supplement containing oxytetracycline and whose dams had been fed diets containing tetracycline.

HAWK, H. W., SIMON, J., MCNUTT, S. H. & CASIDA, L. E. (1957). **Investigations on the endocrine-controlled defense mechanism of estrous and pseudopregnant rabbit uteri.** — *Amer. J. vet. Res.* **18,** 171-173. [Authors' summary modified.] **1358**

Uteri of pregnant and pseudopregnant rabbits were inoculated with 0·2 ml. of a suspension of *E. coli*. A difference was found in the number of organisms recovered, which could not be accounted for by differences in the properties of the uterine secretions as culture media. The numbers of live *E. coli* recovered at the end of 4 hours from intact uterine horns were 3,470,000 for the oestrous and 200 million for the pseudopregnant. The difference between these was greater than the difference found in ligated horns inoculated with bacteria after removal from the animal, of 166 million for the oestrous and 234 million for the pseudopregnant horns.

When heat-killed *E. coli* were injected into the lumen of one uterine horn of oestrous and pseudopregnant rabbits to stimulate the defence mechanism, and when, 15 hours later, live *E. coli* were introduced into both horns in each rabbit, the numbers of live organisms recovered from the four classes of uterine horns after 4 hours were: sensitized oestrous, 30,200; control oestrous, 5,750,000; sensitized pseudopregnant, 1,020,000; and control pseudopregnant, 209 million.

BLATTBERG, B. (1956). **Increase in bactericidal activity as a result of injection of zymosan.**— *Proc. Soc. exp. Biol., N.Y.* **92,** 745-748. [Author's summary modified.] **1359**

The bactericidal activity of rabbit and g. pig sera against *Escherichia coli* was increased by s/c injections into the animals of zymosan [*V.B.* **25,** 2441] mixed with egg white and incorporated in Freund adjuvants. The animals responded to i/d inj. of zymosan with the Arthus phenomenon. Zymosan absorbed the bactericidal activity without affecting the haemolytic activity of the sera. Its possible antigenicity is discussed.

ANDERSON, G. W., HAUSER, M. M., WRIGHT, M. L. & COUCH, J. R. (1956). **The effect of dietary enterococci and chlortetracycline hydrochloride on the intestinal flora and growth of chicks.**—*Canad. J. Microbiol.* **2,** 733-739. **1360**

Inclusion of antibiotics in the ration of chicks or poults results in improved growth possibly because of the destruction of unfavourable intestinal organisms, the increase of favourable organisms, or the destruction of organisms which compete with the host for nutrients. The authors found that the daily addition of a high level of viable β-haemolytic enterococci to the chick ration caused a highly significant reduction in growth. This was accompanied by an increase in caecal enterococci, a decrease in coliforms in the ileum and a decrease in lactobacilli in all segments of the intestine. Adding 40 g. of crystalline chlortetracycline hydrochloride to the ration prevented growth reduction due to the enterococci and reduced the number of enterococci in the ileum and caeca.— A. S. GREIG.

MCCLURE, H. E., EVELAND, W. C. & KASE, A. (1957). **The occurrence of certain Enterobacteriaceae in birds.**—*Amer. J. vet. Res.* **18,** 207-209. [Authors' summary modified.] **1361**

Sixty-one specimens of droppings from 13 species of wild birds were examined for the occurrence of bacteria of the family Enterobacteriaceae. The intestinal flora of these birds resembled that of man and domestic animals and similar bacteria were found in soils and on vegetables.

CLARENBURG, A., KAMPELMACHER, E. H. & LOK, B. (1956). Infectie bij varkens met een zeldzame S. cholerae suis-stam. [**Infection of pigs with a rare strain of** *S. cholerae-suis.*]— *Tijdschr. Diergeneesk.* **81,** 1025-1028. [English, French and German summaries.] **1362**

A Dutch version of the report previously abstracted [*V.B.* **27,** 37.]—R.M.

SEIDEL, G. & PLASCHKE, W. (1956). Mitteilung über gehäuftes Aufreten von S. braenderup bei Schweinen. [**Increased incidence of** *S. braenderup* **in pigs.**]—*Arch. Lebensmittelhyg.* **7,** 243-244. **1363**

Eleven strains of *S. braenderup* were isolated within ten days from pigs in a Berlin abattoir, and one from blood kept in cold storage there. Measures proposed for the control of human and animal salmonellosis included setting up of a special committee to suggest legal and other control measures to the government departments concerned.—E.G.

KOTLÁN, A. (1956). Über die Rolle von Darmnematoden beim Zustandekommen bakterieller Infektionen nebst Bemerkungen

über die Pathogenität von Oesophagostomum dentatum. [**Role of nematodes in bacterial intestinal infections and pathogenicity of** *Oesophagostomum dentatum.*] — *Wien. tierärztl. Mschr.* **43,** 658-664. [English, French and Italian summaries.] **1364**

Massive experimental infection of young pigs with 20–190,000 infective *Oes. dentatum* larvae resulted in activation of facultative pathogenic bacteria (*Salmonella cholerae-suis*) in the intestine, producing clinical symptoms and lesions of paratyphoid infection. Since massive infestation by *Oes. dentatum* under natural conditions is rare, and this species is of low pathogenicity, it would be wrong to draw conclusions regarding the aetiological significance of nematode infestation in salmonellosis.

—F. K. Leeb.

Rolle, M. & Säring, H. (1956). Experimentelle Untersuchungen über die latente Infektion mit Salmonellen. [**Experimental studies on latent infection with salmonella.**] —*Zbl. VetMed.* **3,** 592-598. [English, French and Spanish summaries.] **1365**

In mice artificially infected with *S. typhi-murium,* treatment with chloramphenicol reduced the mortality rate only when it was begun in the later stages of the infection; early treatment merely prolonged the incubation period. Most of the survivors became carriers and at this stage the drug appeared to have little effect. Unweaned litters left with infected dams developed normally, but about one third had symptoms of the infection and subsequently became carriers. Passage of *S. typhi-murium* from the intestine into the tissues appears to be favoured by the presence of *Escherichia coli* toxins.—F. K. Leeb.

Frank, J. F. & Wright, G. W. (1956). **The disinfection of eggs contaminated with** *Salmonella typhi-murium.*—*Canad. J. comp. Med.* **20,** 406-410. [French summary.] **1366**

The penetration of *S. typhi-murium* into eggs after artificial contamination of the shells was not prevented by immersion of the contaminated eggs in aqueous solutions of 1 or 2% sodium hydroxide for 5 min. Most of the contaminated and treated eggs that failed to hatch after incubation were found to be infected.—A. Greig.

Bailey, W. R. (1956). **Studies on the transduction phenomenon. I. Practical applications in the laboratory. II. The occurrence of** *Salmonella* **transducing phages in nature.** — *Canad. J. Microbiol.* **2,** 549-553 & 555-558. **1367**

I. The term transduction is used to describe a phenomenon whereby certain characteristics are carried from one bacterial cell to another by means of a phage. The technical method involves the preparation of a lysate containing phage produced in a donor strain of bacterium and the subsequent adsorption of the phage on the bacterial strain to be "transduced." Non-motile variants of bacterial strains treated so as to develop flagella and motility may be typed with appropriate antisera. In the experiments described non-motile strains of *Salmonella derby, S. dublin* and *S. typhi* were successfully "transduced" to motile forms using phage PLT 22 and *S. typhi-murium* TM_2 as donor. A culture of non-motile *S. paratyphi C* was treated and motile cultures produced by means of the phage P 1/19 propagated on *S. cholerae-suis* or *S. bareilly.*

II. An investigation of 115 strains of *S. typhi-murium* recovered from human, avian and animal sources across Canada revealed that 14 strains carried transducing phage. Nine of the strains were from man, four from poultry and one from cattle. The appearance of new serotypes of *Salmonella* in various parts of the world is suggestive that transducing phage may play a role in the evolution of the genus in nature.

—A. Greig.

Gaugusch, Z. & Kafel, S. (1956). Antagonizm pomiędzy pałeczką *E. coli* a *S. pullorum* w zastosowaniu praktycznym. [**Practical applications of antagonism between** *E. coli* **and** *S. pullorum.*]—*Méd. vét., Varsovie.* **12,** 662-666. [In Polish. English and Russian summaries.] **1368**

Growth of *Salmonella pullorum* was inhibited *in vitro* in the presence of a strain of *Escherichia coli.* Incidence of *S. pullorum* infection, and consequently the mortality rate, was reduced in day-old chicks, given before exposure to infection a suspension of *E. coli* culture *per os,* which they appeared to tolerate without ill effects. The practical value of these findings was discussed.—M. Gitter.

Landi, A. (1956). Le brucellosi animali con osservazioni sulla diffusione in provincia di Cremona. [**The incidence of brucellosis in animals in the Province of Cremona, Italy.**] —*Gazz. Vet., Milano.* No. 3. pp. 9-20. **1369**

Between 1951 and 1955 the annual number of outbreaks of bovine brucellosis in Cremona rose from 29 to 66. The only two outbreaks reported in sheep were in 1954 and 1955.

—I. W. Jennings.

SCHMID, G. (1956). Über den Nachweis von Bang-Agglutininen im Vaginalsekret von Bang-infizierten Kühen. [**Demonstration of brucella agglutinins in the vaginal mucus of cows infected with** *Br. abortus*.]—*Schweiz. Z. allg. Path.* **19,** 539-543. **1370**

The vaginal mucus agglutination test described by Kerr [*V.B.* **25,** 3148] proved to be reliable and of value for detecting cows with uterine infection. 20 cows were tested, and the results compared with the agglutination titre of the blood. One cow which gave a positive vaginal mucus test aborted 17 days later.—R.M.

DECOWSKI, M. & ŻÓRAWSKI, C. (1956). Siewstwo pałeczek Brucella S. 19 w świetle okresowych badań mleka. [**Presence of** *Br. abortus* **Strain 19 in the milk of immunized cows.**]—*Méd. vét., Varsovie.* **12,** 645-647. [In Polish. English and Russian summaries.] **1371**

The milk of 85 cows was examined bacteriologically before and daily for 14 days after vaccination with *Br. abortus* Strain 19. The organism was isolated from the milk of one cow (9 years old and in poor bodily condition) 24 and 48 hours after vaccination.—M. GITTER.

SEELEMANN, M., BÖRGER, K. & MEYER, A. (1956). Untersuchungen über den Verlauf der Brucellose-Schutzimpfungen mit Stamm 19 unter Berücksichtigung der serologischen Blut- und Milchwerte sowie von Schlacht- und Plazentabefunden. I. Der Verlauf der serologischen Blut- und Milchwerte während der Sanierung. [**Immunization of cattle with Strain 19. Results of tests on blood and milk, examination of placentas and P.M. findings. I.**]—*Mh. Tierheilk.* **8,** 205-218. **1372**

SEELEMANN, M., BÖRGER, K. & MEYER, A. (1956). Untersuchungen über den Verlauf der Brucellose-Schutzimpfungen mit Stamm 19 unter Berücksichtigung der serologischen Blut- und Milchwerte sowie von Schlacht- und Plazentabefunden. II. Schlachtbefunde von Impflingen. [**Immunization of cattle with Strain 19. Results of tests on blood and milk, examination of placentas and P.M. findings. II.**]—*Ibid.* 235-247. **1373**

SEELEMANN, M., BÖRGER, K. & MEYER, A. (1956). Untersuchungen über den Verlauf der Brucellose-Schutzimpfungen mit Stamm 19 unter Berücksichtigung der serologischen Blut- und Milchwerte sowie von Schlacht- und Plazentabefunden. III. Weitere Plazentabefunde aus Impfbeständen. [**Immunization of cattle with Strain 19. Results of tests on blood and milk, examination of placentas and P.M. findings. III.**] — *Ibid.* 257-264. **1374**

SEELEMANN, M., BÖRGER, K. & MEYER, A. (1956). Untersuchungen über den Verlauf der Brucellose-Schutzimpfungen mit Stamm 19 unter Berücksichtigung der serologischen Blut- und Milchwerte sowie von Schlacht- und Plazentabefunden. IV. Biologische Prüfungen an den aus Plazenten isolierten Brucellastämmen. [**Immunization of cattle with Strain 19. Results of tests on blood and milk, examination of placentas and P.M. findings. IV.**]—*Ibid.* 309-323. **1375**

I. The authors have been occupied with the problem of cattle with persistent blood titres to the slow agglutination test in dairy herds which, according to the flocculation test and milk serological tests, have long been freed from brucellosis. The percentage of reactors is higher in animals which were vaccinated when 10–15 months old than among those which were vaccinated when 4–9 months old. The titres are usually not high, ranging from 1 : 20 to 1 : 80.

II. Six of these persistent reactors were slaughtered. Brucella could not be recovered from the organs and lymph nodes either by g. pig inoculation or by culture on potato agar. Agglutination titres developed, however, in g. pigs inoculated with material from the liver, udder, and lymph nodes of the udder from one animal, slaughtered 13½ months after vaccination.

The authors failed to recover brucella from 3 calves, slaughtered 2 days, 3 weeks, and 7½ months after infection with virulent *Br. abortus*, although the last two were strongly positive to the agglutination and flocculation tests. They recovered brucella from 3 out of 4 calves slaughtered 5 days to 3 weeks after vaccination with Strain 19, but not from 5 calves slaughtered 6 weeks to 3½ months after vaccination.

III. *Br. abortus* was isolated by g. pig inoculation from the placentas of 6 out of 98 parturient cows, and was demonstrated in a 7th by the blood titre in one of 3 inoculated g. pigs. Six of the 7 cows were serologically negative. Five of the animals had been vaccinated as calves with Strain 19, one with Strain Zinna, and one was unvaccinated.

IV. The *Br. abortus* strains recovered from the 6 placentas were, in contrast to Strain 19, virulent for mice and only slightly sensitive to thionin blue. [See also *V.B.* **27,** 1016].

—M.G.G.

HOLLAND, J. J. & PICKETT, M. J. (1956). **Intracellular behavior of Brucella variants in chick embryo cells in tissue culture.**—*Proc. Soc. exp. Biol., N.Y.* **93,** 476-479. [Authors' summary modified.] **1376**

Smooth brucella were ingested by fibroblasts in tissue culture and multiplied within them. Non-smooth variants and Strain 19 neither multiplied nor survived long intracellularly unless the cells were massively infected. Brucella remained viable intracellularly for over 30 days despite the presence of a bactericidal concentration of streptomycin. Extensive cytopathogenicity was not evident except with *Br. suis* which caused slow destruction of the fibroblasts. Under the same conditions *Salmonella typhi* multiplied rapidly intracellularly and caused complete cell destruction within several days. Mixed infections of fibroblasts with smooth and non-smooth brucella showed the intracellular environment to be highly selective for the smooth type. Mutation from I to S and M to S, followed by selection of the S type, occurred in several heavily inoculated tissue cultures. The addition of anti-S antiserum or DL-α alanine did not affect the selection.

REDFEARN, M. S., SIMON, E. M. & BERMAN, D. T. (1956). **The establishment of colonial variants in guinea pigs infected with smooth *Brucella suis*.**—*J. infect. Dis.* **99,** 234-240. [Authors' summary modified.] **1377**

A study of g. pigs infected with smooth and variant *Br. suis* revealed that variant organisms selected *in vivo* have no greater competitive advantage in mixed infections with smooth cells than variants selected *in vitro*. The ability of variant brucella to establish themselves in the tissues of g. pigs infected with smooth organisms was influenced by the duration of the smooth infection. Dermal reactions to smooth and variant whole cell antigens indicated that an additional selective factor, the changing host response during the course of infection, may play a significant role in population changes in g. pigs infected with smooth brucella.

VENSKE, W. & STRAUCH, D. (1956). Untersuchungen über die Anwendung 5%iger NaCl-Lösung bei der Agglutination und aktiven Serums bei der Komplementbindungsreaktion in der Diagnostik der Schafbrucellose. **[Diagnosis of brucellosis in sheep using a 5% solution of sodium chloride instead of physiological saline in the agglutination test, and active instead of inactivated serum in the complement-fixation test.]**—*Berl. Münch. tierärztl. Wschr.* **69,** 490-492. [English summary.] **1378**

By using a 5% solution of sodium chloride instead of normal saline in the agglutination test, 8% more positive results were obtained. In the c.f. test the active serum was superior to the inactivated serum, producing again 8% more positive results. In the diagnosis of sheep brucellosis the agglutination test takes first, the allergic test second place; but with the c.f. test positive reactors could be detected which could not be diagnosed by either of the other two tests.—F. K. LEEB.

GILLESPIE, R. W. H., KENZY, S. G., RINGEN, L. M. & BRACKEN, F. K. (1957). **Studies on bovine leptospirosis. III. Isolation of *Leptospira pomona* from surface waters.**—*Amer. J. vet. Res.* **18,** 76-80. [Authors' summary modified. For previous parts, see *V.B.* **25,** 3151 & **27,** 395.] **1379**

Five strains of *L. pomona* were recovered from surface waters in 4 areas infected with bovine leptospirosis. The sources included pools surrounding a leaking irrigation pipe or created by overflow from stock tanks, and natural swift-flowing streams.

BURGDORFER, W. (1956). **The possible role of ticks as vectors of leptospirae. I. Transmission of *Leptospira pomona* by the argasid tick, *Ornithodoros turicata*, and the persistance of this organism in its tissues.**—*Exp. Parasit.* **5,** 571-579. **1380**

Nymphs and adults of *O. turicata*, fed on hamsters or air-sac membranes of embryonated hens' eggs infected with *L. pomona*, transmitted leptospira to g. pigs in 15 of 35 transmission experiments. After an infective blood meal, leptospira penetrate the gut wall into the haemocoele of the tick; here multiplication occurs and infection extends to the salivary glands, central ganglion, coxal organs and tissues of the excretory and genital organs. Leptospira were also found in developing egg follicles, but no evidence of transovarial transmission was obtained. The coxal fluid of infected ticks regularly contained large quantities of *L. pomona*. The ability of *O. turicata* to preserve and transmit *L. pomona* for at least 518 and 232 days respectively, suggests that the tick may naturally serve as a vector of leptospirosis.—D. POYNTER.

I. HAMDY, A. H. & FERGUSON, L. C. (1957). **Virulence of *Leptospira pomona* in hamsters and cattle.**—*Amer. J. vet. Res.* **18,** 35-42. **1381**

II. Ferguson, L. C., Ramge, J. C. & Sanger, V. L. (1957). **Experimental bovine leptospirosis.**—*Ibid.* 43-49. [Authors' summaries modified.] **1382**

I. *L. pomona* was maintained in hamsters by direct passage using infected blood. In the early passages, the hamsters were readily infected; mortality was low but, when the hamsters were killed up to 84 days later, the kidneys were grossly involved and leptospires were demonstrated by dark-field microscopy. The strain increased in virulence with passage: at the 16th passage, the hamsters died within 4 days; by the 20th passage, all died on the 3rd day. However, at the 26th passage, the virulence appeared to decline; the hamsters died after 6 days. In a second serial passage, hamsters started dying by the 5th day after exposure at the 29th passage with mortality approximating 100%. At the 51st passage, 0·2 ml. of a 10^{-9} dilution caused death within 11 days while a 10^{-10} diln. was not infective. In both trials, the number of leptospires in the inoculum and probably the age of hamsters appeared to be factors in the decline of virulence. Tissues from the 7th hamster passage caused severe leptospirosis in 2 young bulls and a pregnant heifer. The strain appeared to lose its virulence for cattle after 23 or more passages through hamsters; 3 young bulls developed only mild clinical signs.

II. All of 12 cattle exposed to *L. pomona* by i/m inoculation developed leptospirosis. One of these, a yearling bull, became seriously ill and died on the 7th day: the lesions were typical of leptospirosis. Of 9 pregnant cows, 3 aborted on the 19th, 20th and 47th days, after exposure to *L. pomona*. Histopathological lesions closely resembled those in the naturally occurring disease. The presence of a toxic substance, released from the leptospires when large numbers are destroyed by antibodies, was suggested. This substance may cause the destruction of r.b.c. in the cow and it may pass the placental barrier, destroying some or all of the r.b.c. of the foetus. This latter effect is suggested as the cause of abortion in which no leptospires are demonstrated in the foetus.

Morse, E. V. & Allen, V. (1956). **Serological cross-agglutination reactions between *Leptospira pomona* and *Leptospira icterohaemorrhagiae*, AB.** — *Amer. J. vet. Res.* **17,** 563-568. **1383**

Agglutinins and lysins to *L. icterohaemorrhagiae* were present in the serum of 183 out of 219 cattle naturally infected with *L. pomona*. Agglutination titres with the latter organism were generally higher than those with *L. icterohaemorrhagiae*. Absorption of the sera with *icterohaemorrhagiae* lowered their reactivity to *pomona*.—R.M.

Hoag, W. G. (1957). **The presence of *Leptospira sejroe* agglutinins in cattle serum.**—*Amer. J. vet. Res.* **18,** 50-52. [Author's summary modified.] **1384**

Bovine sera containing agglutinins against *Brucella abortus* and *Vibrio fetus* were tested against 16 leptospiral antigens (living cultures) in the microscopic agglutination-lysis test: they were negative to all of the leptospiral antigens. *L. ballum* and *L. sejroe*, when inoculated separately into 2 calves, each produced agglutinins against the homologous strain antigen but not against the other antigen. Therefore H. suggested that the presence of *L. sejroe* agglutinins in bovine serum was due to exposure to *L. sejroe*. Bacteriological proof is still needed to substantiate such serological evidence of the existence of this serotype in the U.S.A.

Gentile, G. (1956). Epato-nefrite itterigena leptospirotica del cane (Weil canino). I. Contributo clinico, sperimentale e di laboratorio. **[Leptospiral icteric hepato-nephritis in dogs.]** —*Zooprofilassi* **11,** 640-675. **1385**

G. gave a clinical description of Weil's disease in dogs in Bologna and of 6 experimental cases in young dogs. Bile pigments began to appear in the urine 1–2 days before the first clinical signs. Urobilin was, however, always absent at the height of the disease. The peripheral blood showed neutrophile leucocytosis and slight polycythaemia. Sternal bone-marrow samples from the experimental cases were examined and the results recorded. During the convalescent period there was increased activity of the erythropoietic and leucopoietic tissues. As the red and white cell picture returned to normal there was a slowing down of the red cell maturation rate.—I. W. Jennings.

Davies, M. E. (1957). **A further note on the examination of canine sera for evidence of leptospirosis.**—*Vet. Rec.* **69,** 93-94. [Author's summary modified.] **1386**

Of 200 canine sera examined for agglutinins to 5 different strains of leptospira, 34 agglutinated *L. canicola*, 11 *L. icterohaemorrhagiae*, one *L. mitis* and one *L. pomona*. The significance of the possible rare occurrence of these strains in Gt. Britain is discussed.

Moskowitz, M. (1956). **Metal chelates as therapeutic and detoxifying agents in gas gangrene.**—*Proc. Soc. exp. Biol., N.Y.* **92,** 706-709. [Author's summary modified.] **1387**

The calcium chelate of ethylenediamine tetraacetic acid protected mice against a lethal dose of *Clostridium welchii* toxin, and g. pigs against experimental *Cl. welchii* infection.

ZELLER, M. (1956). Enzootischer Pararauschbrand in einer Schweinemastanstalt. [**An outbreak of *Clostridium septicum* infection in a piggery.**]—*Tierärztl. Umsch.* **11,** 406-408. **1388**

Of the 6 affected pigs 3 died and one had to be destroyed. Two recovered after s/c or i/m injection of "Supronal" and terramycin given orally or injected i/m. All in-contact animals were inoculated with a specific antiserum, followed 3 weeks later by 5 ml. of a formolized vaccine, and no further cases occurred. Attention is drawn to the possible confusion of this infection with fatal syncope.
—F. K. LEEB.

BELL, J. F., FARRELL, R. K. & GORHAM, J. R. (1957). **A polyvalent toxoid for botulism in mink.**—*Amer. J. vet. Res.* **18,** 167-170. [Authors' summary copied *verbatim*.] **1389**

A method is described for the preparation of toxoids of *Clostridium botulinum* types A, B, and C. The entire procedure from inoculation of culture to removal of excess formalin from the toxoid may take place in a closed system. One injection of a mixture of alum-precipitated toxoids thus produced was efficacious in protecting mink against large doses of type C toxin, the most common cause of botulism on mink farms.

ERTÜRK, O. (1956). Sığırlarda vibriosis. [**Value of the complement-fixation test in the diagnosis of *Vibrio fetus* infection in cattle.**] —*Vet. Fak. Derg.* **3,** 16-33. [In Turkish. Abst. from English summary.] **1390**

Complement-fixation tests were carried out with sera from 20 cattle (most of them infected). Antigen was prepared by treatment with methyl alcohol and acetone of cultures of *V. fetus* on thiol medium to which glutathione (0·05 g./litre) and agar (20 g./litre) had been added. Rseults agreed with those of agglutination tests with blood or vaginal mucus. [See also *V.B.* **26,** 1896.] For treatment of vibriosis, tetracycline was preferred to other antibiotics.—R.M.

MORGAN, W. J. B. (1957). **A note on the isolation and identification of *Vibrio fetus* from cattle.**—*Vet. Rec.* **69,** 32-33. [Author's conclusions modified.] **1391**

V. fetus has been easily and frequently isolated from the anterior vaginal mucus of recently infected cattle. Results with uterine biopsy material were less successful. On primary isolation from these sources, heavy growth is often obtained either in the form of colonies up to 2 mm. in diameter, or as a grey spreading film. Pure cultures can be obtained from these although, on first subculture, growth is never profuse.

Catalase-negative vibrios are sometimes isolated, growth often occurring as a grey film. They are distinguished from *V. fetus* by biochemical tests. They have, on a few occasions, been isolated from unmated heifers and frequently from heifers inseminated with the semen of bulls free from *V. fetus* infection. They are commonly isolated from the sheath and semen of bulls. Colonies are about 2 to 3 mm. in diam., circular, raised, and flat, with a greenish tinge. The surrounding medium is often discoloured. Although *V. fetus* occurs in the semen and sheath of infected bulls, it has not been isolated from these sites. Present experience indicates that the only reliable means of diagnosing the infection in bulls is by test mating with a vibrio-free heifer, culturing mucus from the anterior vagina, and submitting the isolated vibrio to biochemical tests.

CZARNOWSKI, A. (1956). Przypadki wibriozy bydła i owiec na terenie województwa gdańskiego. [*Vibrio fetus* **infection in cattle and sheep in the Gdansk (Danzig) province.**] —*Mèd. vét., Varsovie.* **12,** 641-645. [In Polish. English and Russian summaries.] **1392**

Sporadic abortions in cattle caused by *V. fetus* have been reported in the province since 1955. Vibrionic abortions in sheep, not previously recorded in Poland, occurred in two flocks; in one of them 50%, in the other 80% of ewes aborted. No clinical symptoms preceded abortions and the ewes appeared fully recovered within 2–3 days. One of the flocks was housed with pregnant cows and heifers, none of which aborted. Agglutination tests did not reveal any serological differences between a bovine and an ovine strain.—M. GITTER.

FLORENT, A. (1956). Méthode d'isolement de *Vibrio foetus* à partir d'échantillons polymicrobiens, spécialement du liquide préputial. Milieu sélectif "coeur-sang-gélose au vert brillant" en microaérobiose. [**Isolation of *V. fetus* from contaminated samples, particularly preputial washings, by means of a selective culture medium containing brilliant green.**]—*C. R. Soc. Biol., Paris.* **150,** 1059-1061. **1393**

In an agar containing brilliant green at a

dilution of 1:40,000 *V. fetus* was isolated from 80% of samples taken from 18 bulls with *V. fetus* infection.—M.G.G.

SIMON, J. & MCNUTT, S. H. (1957). **Histopathological alterations of the bovine uterus. I. Studies with *Vibrio fetus*.**—*Amer. J. vet. Res.* **18,** 53-66. [Authors' summary modified.] **1394**

Cultures of *V. fetus,* inoculated into the uterus (by laparotomy) and intravenously, were capable of causing premature births. The major lesions in experimentally induced vibriosis were: salpingitis, endometritis, and extensive inflammatory oedema of the foetal membranes. *V. fetus* infection in 2 brucella-free heifers resulted in the development of positive blood-agglutination titres to brucellosis. The tube-agglutination test, using serum, was unreliable for the routine detection of vibriosis.

MUTOVIN, V. I. (1956). **[Aetiology and epidemiology of foot rot in sheep.]** — *Veterinariya, Moscow.* **33,** No. 10. pp. 53-57. [In Russian.] **1395**

M. defined foot rot as infectious chronic pododermatitis of obscure aetiology. It tended to remain stationary in affected flocks, but was spread by the introduction into healthy flocks of affected sheep, often rams. Transmission to healthy sheep by contact with affected sheep failed if the pasture or building was dry, but succeeded on muddy pastures. Transmission by scarification succeeded only if the foot was kept moist and the horn macerated by keeping it in a rubber boot before and after scarification. *F. necrophorus* was normally present in affected feet, but only tissues of ectodermal origin were involved in foot rot, whereas in generalized *F. necrophorus* infection tissues of ectodermal, mesodermal and entodermal origin were involved. The key to eradication was the organization of pasturing, particularly in autumn and winter, to prevent the sheep from standing in mud and dampness. Under such conditions M. claimed that foot rot was eradicated in a few months. [See also *V.B.* **26,** 1902.]—R.M.

FORD, A. C. & DEFALCO, R. J. (1956). **Studies on bacterial agglutination by use of the antiglobulin (Coombs) technique.**—*Canad. J. Microbiol.* **2,** 657-664. **1396**

The Coombs antiglobulin test, when applied to bacterial agglutination reactions, has been shown to give titres in higher dilutions than those used in routine agglutination tests. The present paper reports the results of applying the Coombs test to bacterial agglutinations, using rabbit antisera and nine different species of bacteria in homologous and heterologous reactions. Also reported is the use of human and bovine albumin and polyvinylpyrrolidone (PVP) in accelerating and strengthening the reaction. It is shown that the Coombs test generally results in higher titres than obtained by routine agglutination. Controlled tests showed that the use of albumin and PVP also results in greater reactions than found in the routine agglutination test. The heterologous tests showed that there is no reaction where there is no combination between antibody globulin and cell antigen.—A. S. GREIG.

HENDERSON, D. W., LANCASTER, M. C., PACKMAN, L. & PEACOCK, S. (1956). **The influence of a pre-existing respiratory infection on the course of another superimposed by the respiratory route.**—*Brit. J. exp. Path.* **37,** 597-611. [Abst. from survey of paper (p. ii).] **1397**

G. pigs infected by inhalation were often protected against infection with another organism by the same route 3 weeks later. *Brucella suis* infection protected against *Bacillus anthracis, Mycobacterium tuberculosis* and, under certain conditions, *Pasteurella pestis;* primary infection with *M. tuberculosis* protected against *Br. suis* and *B. anthracis.* There was no protection against Group C streptococcus infection, nor did this protect against others. Protection is believed to depend on invasion of the lymphatic system; another species invading by this route is resisted.

SCHWEINBURG, F. B., DAVIDOFF, D., KOVEN, I. H. & FINE, J. (1956). **Host resistance to bacteria in hemorrhagic shock. VI. Effect of endotoxin on antibacterial defense.**—*Proc. Soc. exp. Biol., N.Y.* **92,** 662-667. [Authors' summary and conclusions modified.] **1398**

The mortality rate in rabbits from an i/v dose of endotoxin fell from 100% to 40–60% when antibiotics were given before or at the same time as the endotoxin. This was so even if the antibiotics were given orally and were not absorbable. Therefore, endotoxins from intraintestinal bacteria are involved in the death from an intravenous MLD/100 of endotoxin. Data are given to show that antibiotics act solely as antibacterial, and not as anti-endotoxic agents. A sublethal i/v dose of endotoxin induced high sensitivity, so that a second dose given one hour later caused 67% mortality, even though the two doses were not lethal if combined in a single

dose. Recovery of nearly normal resistance to the second dose of endotoxin required about 4 hours. Antibiotics given with the initial dose rendered the second dose harmless; but the same antibiotics given with the second dose did not prevent death. It is therefore inferred that death from the second dose was due to the production of additional endotoxin. Reasons are given for inferring that similar phenomena occur in haemorrhagic shock and account for the development of irreversibility to transfusion.

ATTINGER, E. O., GOLDSTEIN, M. M. & SEGAL, M. S. (1956). **Ventilation in chronic pulmonary emphysema. I. Pressure-volume and pressure-flow relationships. II. Correlation of compliance and mechanical resistance with routine pulmonary function tests.**—*Amer. Rev. Tuberc.* **74,** 210-219 & 220-228. [French and Spanish summaries.] **1399**

A study of the pathological physiology of chronic pulmonary emphysema in man.—R.M.

CHODNIK, K. S. (1956). **Mycotic dermatitis of cattle in British West Africa.**—*J. comp. Path.* **66,** 179-186. **1400**

C. described the clinical symptoms, pathology and microbiology of a skin disease of cattle which closely resembles a condition reported from other parts of Africa as cutaneous streptothricosis. The disease is a chronic exudative dermatitis characterized by the formation of crusts. In humid weather lesions spread all over the body. Secondary infection with other pathogenic organisms invariably causes death. C. isolated from the lesions of 46 animals a fungus belonging to the *Streptomyces albus* group. Ten cattle, into whose scarified skin cultures of the fungus were rubbed, developed lesions like those of the natural disease.—M.G.G.

TARLATZIS, C. B., PANETSOS, A. G. & DRAGONAS, P. N. (1957). **The effects of some antibiotics and chemical drugs on the growth *in vitro* of *Aspergillus fumigatus*.**—*Amer. J. vet. Res.* **18,** 214-215. [Authors' summary modified.] **1401**

Penicillin was inactive against *A. fumigatus in vitro* in concentrations up to 125μg./ml., but was fungistatic at 250μg./ml. or higher. Streptomycin, tetracycline, chlortetracycline, oxytetracycline, chloramphenicol, erythromycin and potassium iodide were fungistatic in conc. of up to 10 mg./ml. Mercuric iodide was fungistatic at conc. up to 19 μg./ml. and fungicidal at higher concentrations. Experiments are in progress concerning the use of mercuric iodide *in vivo* against avian aspergillosis.

GERLACH, F. & HEIKKILA, I. (1956). **Immunisation of cattle against contagious bovine pleuropneumonia utilising strains of the infective agent adapted to mice.**—*Bull. epiz. Dis. Afr.* **4,** 193-195. [In French. p. 227.] **1402**

Immunity against bovine contagious pleuropneumonia was produced within 21 days in cattle by inoculation with a polyvalent vaccine composed of mouse-adapted strains of the organism. Reactions consisting of abscess formation in the sacral lymph nodes were noted in 3 of the 52 cattle inoculated. These findings suggest that it may be possible to produce an effective vaccine using mouse-adapted strains.

—A. ACKROYD.

POLKOVNIKOVA, R. S., IVANO, S. P. & SMIRNOV, I. I. (1956). **[Specific prophylaxis of caprine contagious pleuropneumonia.]**—*Trud. kirgiz. nauchno-issled. vet. oput. Stants.* **3,** 67-89. [In Russian]. Abst. from abst. in *Referat. Zh., Ser. Biol.* No. 22. p.547. (1956). **1403**

An aluminium hydroxide formol vaccine was injected s/c in two 5 ml. doses given 6–7 days apart. When used in Kirgizia the effectiveness of the vaccine was stated to be 90–99% on infected farms.—R.M.

TELLO GARUST, A. & NÓBREGA, P. (1956). Doença crônica respiratória no Brasil. **[Chronic respiratory disease of fowls, in Brazil.]**—*Arch. Inst. biol.* (*Def. agric. anim.*), *S. paulo.* **23,** 35-38. [English abstract.] **1404**

Chronic respiratory disease of fowls was first suspected in Brazil in 1954; it was confirmed in 1955. Affected birds had nasal discharge, conjunctivitis and dyspnoea; P.M. lesions were tracheitis, inflammation of the air-sacs, and pneumonia. Pleuropneumonia-like organisms were isolated from 4 out of 30 cases and, after 3–4 passages through 6-day chick embryos, these organisms caused a mortality of 70–100% in embryonated eggs. Smears (stained by the Macchiavello method) from the yolk sac of dead chicks revealed elementary bodies in the cellular cytoplasm.—I. W. JENNINGS.

See also abstr. **1529** (diseases of wild birds in Britain); **1625-1626** (reports, Australia).

DISEASES CAUSED BY PROTOZOAN PARASITES

AUSTIN, W. C., COLLIER, H. O. J., POTTER, M. D., SMITH, G. K. A. & TAYLOR, E. P. (1957). **A new compound active against *Trypanosoma congolense* and *T. vivax*.**—*Nature, Lond.* **179,** 143-144. **1405**

Administered s/c to mice, a new compound, an unsymmetrical isomer of the hydriodide of 6[1] (4-quinaldylamino) hexyl-4-aminoquinaldinium iodide, was more active than antrycide against *T. congolense* and *T. vivax* infections, and less toxic. Solutions of its chloride had appreciable prophylactic activity against *T. congolense* infection in mice; the period of prophylaxis was more than doubled, however, by administration of a combination of the chloride and suramin.—M.G.G.

CABRERA, D. J. & LUI, T.-J. (1956). **The nuclear shift index and other hematological indexes in surra.**—*Amer. J. vet. Res.* **17,** 615-625. **1406**

In infected pigs and dogs an exaggerated regenerative shift to the left is seen. Resistance to infection is reflected in the white cell response. In resistant pigs monocytosis and eosinophilia were observed during the patent periods, while the lymphocytes were only moderately reduced compared with the subpatent level. In the susceptible dog, response to the infection manifested itself in reduction of both lymphocytes and eosinophiles, this reduction becoming modified as the disease increased in severity. Failure of bone marrow and the collapse of resistance were manifested by a severe reduction in neutrophiles and lymphocytes and also by an exaggerated hyper-regenerative leucaemoid shift. Neutrophiles and lymphocytes were closely related, the curves being mirror images of each other. An elevated monocyte-lymphocyte index (MLI) is a sign of activity of the disease and a high neutrophile-lymphocyte index (NLI) indicates a grave prognosis. The normal nuclear shift index, the MLI and NLI are useful in prognosis. They increase during the patent period. In the dog, the prepatent period ranges from 3–8 days. The disease runs an acute course and in the absence of treatment terminates fatally in 4–32 days. Pigs showed no visible signs of disease and at the end of the study all were alive and apparently healthy.—D. POYNTER.

CANTRELL, W. & BETTS, G. D. (1956). **Effect of cortisone on immunization against *Trypanosoma equiperdum* in the rat.**—*J. infect. Dis.* **99,** 282-296. **1407**

High doses of cortisone acetate (up to 200 mg./kg. body wt. daily) given to rats before, during and after immunization did not alter their ability to become immunized when the immunizing procedure consisted of curing heavy infections with oxophenarsine and when the test for immunity consisted of i/v inj. of heavily infected, defibrinated blood. However when the immunizing procedure consisted of curing rats with lower levels of infection, an anti-immune effect of cortisone was found.—D. POYNTER.

GONGIU, S. & SOBRERO, L. (1956). Tripanosi naturale dei caprini Somali. [**Natural trypanosomiasis in goats in Somalia.**]—*Zooprofilassi* **11,** 565-573. **1408**

Morphological and biometrical examinations were carried out on *T. congolense, T. vivax* and *T. brucei* from spontaneous disease in goats, and the organisms were compared with the types found in cattle and donkeys. Morphologically the caprine strains were identical with those of other domestic animals. The caprine *T. congolense* corresponded in size, but on average *T. vivax* was slightly larger, than the bovine strains. With *T. brucei,* owing to its typical polymorphism, there were marked variations in measurements.—I. W. JENNINGS.

HAMMOND, D. M. & LEIDL, W. (1957). Experimentelle Infektion des Genitaltraktes beim Rind mit Trichomonaden aus dem Intestinum des Schweines. [**Experimental infection of the genital tract of bulls and cows with trichomonads from the caecum and faeces of swine.**]—*Berl. Münch. tierärztl. Wschr.* **70,** 9-11. [English summary modified.] **1409**

Four bulls became infected as a result of exposure to trichomonads from the caecum or faeces of pigs. Three were given intrapreputial inoculation with cultures and the fourth was bred to an experimentally infected heifer. In two of the three bulls the original infection was demonstrable for only 11 and 30 days, respectively. When these bulls were given second inoculations the re-infection was demonstrable for 45 days in the first bull and was still present in the second bull about 200 days after inoculation. In the third and fourth bulls the original infection was present 200 and 75 days after exposure, respectively. Infection was transmitted by coitus from the third bull to two virgin heifers. In these heifers trichomonads were demonstrable in vaginal mucus from 4 to 62 and from 3 to 67 days after service, respectively. Pig trichomonads recovered from experimentally infected bulls and cows closely resembled *Tr. foetus.*

JERSTAD, A. C. (1957). **Furazolidone for infectious enterohepatitis (blackhead) of turkeys.**—*Amer. J. vet. Res.* **18,** 174-179. [Author's summary modified.] **1410**

When mash containing 0·02% furazolidone was given to birds which had free access to grain at 8 weeks of age, excessive losses from blackhead did not occur although they were on ground contaminated by infected birds. With furazolidone at 0·0165 and 0·02% of the total feed, deaths due to blackhead in birds in infected pens were usually checked within 8 days. Furazolidone at the 0·011% conc. in the basal ration as the only feed, was relatively ineffective. A conc. of 0·02% produced no discernible detrimental effect on normal turkeys over 7 weeks old, except that sexual maturity was delayed when it was fed to breeding stock approaching the start of egg production. [See also *V.B.* **26,** 1926.]

I. IKEDA, M. (1955). **[Factors necessary for *E. tenella* infection of the chicken. II. Influence of the pancreatic juice on infection.]**—*Jap. J. vet. Sci.* **17,** 225-230. [In Japanese. Abst. from English summary.] **1411**

II. IKEDA, M. (1956). **[Factors necessary for *E. tenella* infection of the chicken. III. Influence of the upper alimentary canal on infection.]**—*Ibid.* **18,** 25-30. [In Japanese. Abst. from English summary.] **1412**

I. Pancreatic extracts (of chickens, rabbits or g. pigs) to which were added freshly sporulated oocysts of *E. tenella* were introduced into the crop and duodenum of 3 weeks old chicks 2–3 days after removal of the pancreatic ducts. All the birds became infected and it is concluded that pancreatic juice plays an important role in *E. tenella* infection in chicks. It is considered that these findings confirm the previous report [*V.B.* **27,** 90].

II. Oocysts were introduced into pouches formed by ligating parts of the crop, proventriculus or gizzard. In each case infection occurred as in normal chickens. In another experiment the distal end of one caecum was anastomosed with the upper portion of the duodenum. It was observed, 4–5 days later, that growth of *E. tenella* was maintained in the anastomosed caecum. It is also stated that "None of the transplanted [anastomosed] ceca became infected in spite of infection of the unoperated side of the ceca [the normal caeca], when dosed with sporulated oocysts of *E. tenella*." The conclusion is drawn that the upper part of the alimentary tract has no essential role in *E. tenella* infection in chickens.

KENDALL, S. B. (1956). **Synergy between pyrimethamine and sulphonamides used in the control of *Eimeria tenella*.**—*Proc. R. Soc. Med.* **49,** 874-877. **1413**

Sulphadimidine and pyrimethamine given together in the food at conc. of 0·05% and 0·005% respectively on the morning of the second day after infection and continuing to the fifth day, controlled the disease and no mortality resulted. It is shown that this effect is not additive but is the result of potentiation, and the results support the hypothesis that pyrimethamine and sulphadimidine act sequentially in a metabolic chain involving *p*-amino benzoic acid and folic or folinic acid.—D. POYNTER.

FRANCIS, D. W. & SCHAFFNER, C. S. (1956). **An investigation of the morphological changes in young chickens and the reproductive performance of adult chickens fed furazolidone or nitrofurazone.**—*Poult. Sci.* **35,** 1371-1381. [Authors' summary and conclusions modified.] **1414**

Studies were conducted with levels of 0·0055 to 0·022% furazolidone or nitrofurazone to evaluate further their safety for fowls. They were given, in a practical ration, to day-old chicks for 4 weeks, to 5-week-old chicks for 3 weeks, and to laying pullets for 16 weeks. The drugs produced small differences in weight in most of the glands, which were usually not significant; however, the thyroid gland appeared to be consistently reduced. Growth rate was significantly lowered when either 0·0165 or 0·022% nitrofurazone was fed. The nitrofurans did not alter the effect of thiouracil on body weight or thyroid size. When fed to laying pullets, they had little or no effect upon egg production, hatchability, or shell quality.

LUCAS, A., TOUCAS, L. & LAROCHE, M. (1956). Un antibiotique doué de propriétés anticoccidiennes: la framcyétine. **[An antibiotic with coccidiostatic properties: framycetin.]**—*Rec. Méd. vét.* **132,** 925-928. **1415**

Framycetin sulphate acts as a coccidiostatic in fowls, pigeons, partridges, pheasants, rabbits and cattle. The cost of treatment is comparable with that of established therapeutic compounds and recovery is rapid.—D. POYNTER.

SCHINAZI, L. A. & BALL, G. H. (1956). **Changes in infectivity of *Plasmodium relictum* for avian hosts.**—*Exp. Parasit.* **5,** 541-550. **1416**

Strain 1Pl-1 of *Pl. relictum* was established in pigeons, with parasitaemias as high as $5000/10^4$ r.b.c., and maintained by i/v blood transfer for 255 days through 15 successive

transfers. Blood transfer from canary to pigeon and pigeon to canary was also obtained. Mosquito transfer was obtained from canary to canary by the bite of *Culex tarsalis*, and from canary to pigeon by i/m inj. of sporozoites. —D. POYNTER.

SEIBOLD, H. R. & BAILEY, W. S. (1957). **Babesiasis (piroplasmosis) in dogs.**—*J. Amer. vet. med. Ass.* **130,** 46-48. [Authors' summary modified.] **1417**

Clinical and pathological findings in 3 dogs with babesiasis are reported. In 2 dogs a definite diagnosis of babesiasis was based on histological demonstration of *Babesia canis* in erythrocytes within the visceral blood vessels. In the third, a presumptive diagnosis was made from the symptoms and lesions.

MAMIKONYAN, M. M. (1955). **[Failure of aminoacriquine therapy in *Theileria annulata* infection of cattle.]** — *Trud. armyan. nauchno-issled. vet. Inst.* **8,** pp. 73-76. [In Russian.] **1418**

Under Armenian conditions the drug aminoacriquine [aminoacrichin] was ineffective in the treatment of bovine theileriosis; it did not cause a disappearance of the parasites from the peripheral blood, as has been claimed by workers in other parts of the U.S.S.R. [See also *V.B.* **26,** 2249 & 3434.]—R.M.

HARTLEY, W. J. (1956). **Some observations on canine toxoplasmosis.**—*N. Z. vet. J.* **4,** 115-118. [Author's summary modified.] **1419**

H. described the identification of toxoplasmosis in 6 dogs in New Zealand and discussed the role dogs may play in the spread of infection to human beings.

HELLBRÜGGE, T., SPEIGLER, W. & GREWING, W. (1956). Klinische, morphologische und serologische Befunde bei der generalisierten Toxoplasmose der Ratte. **[Clinical, morphological and serological findings in generalized toxoplasmosis in rats.]**—*Zbl. Bakt. I (Orig.)* **165,** 495-506. [English, French and Russian summaries.] **1420**

Inoculation into mice of blood and organ material from rats with generalized toxoplasmosis revealed 3 stages of the infection. During the acute phase there was parasitaemia lasting for not more than 3 weeks, passing into a subacute stage in which the agent was to be found chiefly in the liver and brain. Two months later the chronic stage began, in which parasites were demonstrable only in the brain. Titres to the dye test were at their highest during the second and third weeks after infection. Thereafter they gradually declined.—M.G.G.

SIMPSON, C. F., ANTHONY, D. W. & YOUNG, F. (1956). **Parasitism of adult turkeys in Florida by *Leucocytozoon smithi* (Laveran and Lucet).**—*J. Amer. vet. med. Ass.* **129,** 573-576. **1421**

Infections in 2 flocks of turkeys are described. In one instance the infection occurred simultaneously with fowl cholera and in the other with visceral leucosis. It is suggested that *Leucocytozoon* infection acts as a stress factor increasing the severity of coexisting infections. The vector is probably *Simulium slossonae*.

—D. POYNTER.

NEWBERNE, J. W. (1957). **Studies on the histopathology of *Leucocytozoon simondi* infection.**—*Amer. J. vet. Res.* **18,** 191-199. [Author's summary modified.] **1422**

Lesions found in ducks with severe, fatal infection were: liver necrosis; marked enlargement of the spleen from congestion and macrophage proliferation; periportal and diffuse lymphocytic infiltrations in the liver; moderate haemosiderosis in both the liver and spleen; and hyalinization of the splenic adenoid sheaths. Ducks with only moderately acute infection showed histopathological changes similar to, but less severe than, those seen in ducks with fatal infections. Those with light, non-fatal infections showed no evidence of a general systemic reaction.

Local host tissue reaction was seen to occur only in relation to megaloschizonts in the brain and lung tissue, but it did not occur in other organs, nor in relation to hepatic schizonts or gametocytes. Megaloschizonts, regardless of location, were enveloped by a capsular wall of reticular fibres which, except in the brain, developed from condensation of pre-existing reticular fibres on the surface of the expanding megaloschizont. The megaloschizonts and hepatic schizonts observed were briefly described.

See also abstr. **1529** (diseases of wild birds in Britain); **1626** (reports, Australia).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

FLÜCKIGER, G. (1956). Sur l'apparition en Suisse de fièvre aphteuse en provenance de Belgique et sa prophylaxie dans la période du 14 mai au 5 juillet 1956. [**The 1956 outbreak in Switzerland of foot and mouth disease introduced from Belgium.**]—*Bull. Off. int. Epiz.* **45,** 707-716. **1423**

A French translation of an article which has previously appeared in German [see *V.B.* **27,** 442].—M.G.G.

ENRIQUE PALMA, E. (1956). Labor de investigacion del Instituto Nacional de la Fiebre Aftosa. Segunda parte 1954-1956. [**Work of the foot and mouth disease institute, Argentina (1954-1956).**]—*Gac. vet., B. Aires.* **18,** 194-206. [In Spanish.] **1424**

An important part of the work of the Institute was the development of a vaccine grown *in vitro,* but at the time of the report, the vaccine produced from epithelial tissue was still much superior, antigenically. Serological tests on suspected cases of F. & M. disease in man failed to confirm the infection, and the virus is not regarded as being pathogenic to man. Electrophoretic studies on the virus were undertaken in collaboration with the Institute Malbran, and comparative tests with various coadjuvants revealed the superiority of saponin, and the usefulness of carboxymethylcellulose. Work is continuing on the adaptation of the virus to hamsters, g. pigs, day-old chicks, etc. and on the production of complement-fixing sera of high titre. Here again, saponin was shown to be useful in stimulating the production of c.f. antibody in the g. pig.—I. W. JENNINGS.

BODON, L., RICHTER, J. & SZENT-IVÁNYI, M. (1956). **Development of immunity to foot-and-mouth disease in cattle. I. Upon the action of artificial infection.**—*Acta vet., hung.* **6,** 211-215. [In English. Russian summary.] **1425**

Using the agar-gel diffusion technique it was demonstrated that antibodies to F. & M. disease virus first appeared in the serum 6 or 7 days after artificial infection. The amount of gamma globulin in the blood decreased during the first and second days after infection, but remained normal and constant from the 3rd to the 8th day.—R.M.

SCHMIDT, D. (1956). Untersuchungen zur Frage der funktionellen Herzschädigung bei Maul- und Klauenseuche. [**Functional injury of the heart in foot and mouth disease.**]—*Arch. exp. VetMed.* **10,** 175-188. **1426**

Electrocardiographs of 48 cattle were made before and after artificial infection with F. & M. disease. During the first 9 days after infection, changes in the e.c.g. occurred in 45 of them and were most severe at the 8th day. Common changes were bradycardia, lengthening of the Q-T time, shortening of the P-R time, and deformation of the T wave. The cause and significance of these changes were discussed.

—R.M.

SCHNEIDER, B. (1956). Ergebnisse mit über Mäusesäuglinge passagiertem Maul-und-Klauenseuche-Rindervirus. [**Serial passage of foot and mouth disease virus in unweaned mice.**]—*Mh. Tierheilk.* **8,** 176-184. **1427**

Serial passage of F. & M. disease virus types O_2 and C was carried out by the i/p route in unweaned mice. Their virulence rose for mice, while for cattle it diminished. At the 186th passage type O_2 was completely non-pathogenic for cattle. Type C, however, at the 296th passage caused lesions of the heart and tongue muscle of an experimentally infected ox, revealing that it had become myotropic. Both types remained fully virulent for pigs and g. pigs. Of 17 cattle inoculated s/c with the avirulent type O_2 virus 11 were strongly immune and 4 partially immune to challenge infection 2–3 weeks later. Their antibody titres were no higher than those normally obtained with inactivated adsorbate vaccine. Serial passage of type A_5 had to be abandoned because of the declining infectious titre, but the Holland strain of type A was passaged over 100 times.—M.G.G.

KÖTSCHE, W. (1956). Die Züchtung des Maul-und-Klauenseuche-Rindervirus vom Typ O im Gehirn der weissen Maus. [**Propagation of foot and mouth disease virus type O in the brain of the mouse.**]—*Arch. exp. VetMed.* **10,** 168-174. **1428**

Adaptation of type O virus to the mouse brain was achieved by a procedure similar to the adaptation of type A_5 virus [see *V.B.* **23,** 879 & 1885].—R.M.

UBERTINI, B., NARDELLI, L., BAREI, S. & SANTERO, G. (1956). Etudes sur la culture in vitro du virus aphteux selon Frenkel. II. Comparaison des vaccins preparés avec le virus naturel et le virus-culture. [**Studies on the *in vitro* cultivation of foot-and-mouth disease virus by the Frenkel technique. II. Comparison of vaccines prepared with natural virus and with virus-culture.**]—*Zbl. VetMed.* **3,** 767-784. [In French.

English, German and Spanish summaries. English summary modified.] [For part I, see *V.B.* **27**, 1087.] **1429**

The antigenic and immunizing activity of vaccine prepared with culture virus is considerable and allows its use in the field. Vaccines prepared with natural virus, however, have certain advantages over those prepared with culture virus. Strains which have been cultivated *in vitro* without interruption have significantly less immunizing activity than those cultivated after passage in cattle. The results of many experiments suggest that when virus is cultivated for long periods in serial passage, mutants occur. The serum of animals vaccinated with natural vaccine neutralizes the natural virus to a higher titre than culture virus. Conversely, serum of animals vaccinated with culture virus neutralizes culture virus to a higher titre than natural virus. Analogous results are obtained with protection tests in g. pigs.

GIRARD, H. & MACKOWIAK, C. (1956). Au sujet de la concentration en virus du vaccin anti-aphteux. **[Concentration of virus in foot and mouth disease vaccines.]**—*Bull. Off. int. Epiz.* **45**, 497-510. **1430**

From a study of the methods of immunization against F. & M. disease the general conclusion is drawn that the immunizing properties of a vaccine and the duration of immunity depend on a minimum concentration of virus. This level varies with the type as well as the strain of virus and is higher in the case of polyvalent vaccines.—T.E.G.R.

NOBEL, T. A. & MARTON, D. (1956). **[Rabies in mongoose** (*Herpestes ichneumon*).]—*Refuah vet.* **13**, 75. In Hebrew. [English summary (p. 99) slightly modified.] **1431**

The first case of rabies in the mongoose in Israel is reported. This adds another animal to the list of potential virus reservoirs in that country: dogs, jackals, cats, hyenas, wolves, foxes.

I. LAWRENCE, D. A. (1956). **Rabies prophylaxis in Southern Rhodesia.**—*Bull. epiz. Dis. Afr.* **4**, 201-204. **1432**

II. LAWRENCE, D. A. (1956). **Rabies prophylaxis in Southern Africa.**—*Ibid.* 205-207. [In French pp. 229-230.] **1433**

I. After 37 years of freedom from the disease, rabies was re-introduced into Southern Rhodesia in 1950 and spread rapidly. Control methods comprising tie-up orders, destruction of stray dogs, compulsory reporting of suspicious symptoms, reduction of wild vectors, and the building up of a diagnostic service were instituted, but were without much effect. In August, 1951, vaccination of all dogs over the age of 3 months with the Flury strain avianized virus vaccine was introduced and the other measures relaxed. About 80% of dogs have now been immunized, but only now when vaccination of dogs at 3 and 12 months old, revaccination in areas where cases occur and strict enforcement of the other control measures have been adopted, is the disease beginning to be got under control. Rabies has occurred in 110 vaccinated dogs, 50 of which had been vaccinated over 6 months before symptoms appeared, and 7 more than once.

II. In the southern territories of Africa, general prophylaxis against rabies comprises measures to prevent its introduction which vary from a full 6 months' quarantine for imported cats and dogs to dependence on a valid certificate of vaccination. Vaccination must have been performed not less than 30 days and not more than 3 years before the date of importation and revaccination on arrival is usually required. Prevention and control where the disease exists is now based on rapid vaccination or revaccination with the Flury strain avianized virus vaccine together with strict enforcement of sanitary police measures. Vaccination alone is not sufficient as breakdowns do occur.

—A. ACKROYD.

REMLINGER, P. (1956). La vaccinothérapie antirabique risque-t-elle d'être concurrencée par la sérothérapie? **[Immune serum** ***versus*** **vaccine in the treatment of rabies.]**—*Bull. Off. int. Epiz.* **45**, 601-609. **1434**

R. considers that immune serum is not to be used alone, but in conjunction with vaccine in the treatment of rabies.—M.G.G.

STEVENSON, R. E., CHANG, S. L., CLARKE, N. A. & KABLER, P. W. (1956). **Concentration of dilute virus suspensions by alum flocculation.**—*Proc. Soc. exp. Biol., N.Y.* **92**, 764-767. [Authors' summary modified.] **1435**

A method of concentrating Coxsackie virus from dilute suspension is described. This flocculation procedure is capable of detecting as little as 0·00625 LD_{50}/0·02 ml. and is more sensitive than an ion-exchange method currently used. It possesses the additional advantages of being economical and simple.

VON SPROCKHOFF, H. (1956). Die Züchtung des Borna-Virus im infantilen Kaninchengehirn. **[Cultivation of Borna disease virus in the brains of young rabbits.]**—*Zbl. VetMed.* **3**, 735-741. [English, French and Spanish

summaries. English summary slightly modified.] **1436**

Rabbits ½–5 days old were very susceptible to intracerebral infection with the virus of Borna disease (passaged virus from an adult rabbit). In all four passages the incubation period was 12 to 13 days. In two parallel series of intracerebral passages with a mixture of a viral brain suspension and the enzyme hyaluronidase there was, with one exception, a shortening of the incubation time by one to 3 days.

The brains of baby rabbits with Borna disease contained relatively large quantities of complement-fixing antigen. The titre lay between 1:64 and 1:256. In contrast to adult rabbits, the large ganglion cells of Ammon's horn in baby rabbits of the first passage contained intranuclear Joest-Degen inclusions. From the second passage onwards the number of inclusions diminished and they were demonstrable only in a proportion of the animals and in very small numbers. The cerebral reaction in infected baby rabbits in the form of lymphocytic infiltration and glial proliferation was only very slight or completely absent.

MATTHIAS, D. & SCHMIDT, D. (1956). Zur Pathogenese der Innenkörper (Heinz-Körper) bei der ansteckenden Blutarmut der Pferde. **[Pathogenesis of the inclusion bodies in equine infectious anaemia.]**—*Arch. exp. VetMed.* **10,** 257-274. **1437**

Erythrocytic inclusions in equine infectious anaemia, described previously by the authors [*V.B.* **26,** 1242 & 1620], were studied further. Isolated inclusion bodies were present in the r.b.c. of apparently healthy horses, and their numbers increased when the r.b.c. were incubated at 37°C. for 72 hours. Addition of serum from infected horses to the r.b.c. did not increase the rate of formation of inclusion bodies during incubation. When r.b.c. from horses in the febrile stage of infection were incubated, there was a pronounced increase in the number of inclusions, which did not occur with r.b.c. from the non-febrile stage of infection. When added to normal r.b.c., phenylhydrazine, but not sulphanilamide, caused the formation of numerous inclusions during incubation. Although the inclusion bodies were not specific for E.I.A., the infectivity of r.b.c. which had been washed 30 times indicated that they contained the virus.—R.M.

BEUST, F. V. (1956). Recherches sur le virus de l'anémie infectieuse des équidés à l'aide du microscope électronique et d'autres moyens physico-chimiques. **[Electron microscope and physico-chemical studies of the virus of equine infectious anaemia.]**—*Bull. Off. int. Epiz.* **45,** 620-665. **1438**

It was not possible to recognize virus particles by electron microscopy of ultracentrifuged sera from horses with severe infectious anaemia. Studies of the sedimentation of the sera indicated the presence of particles of several different sizes. Paper electrophoresis revealed a considerable increase in the ratio of globulin to albumin; the conc. of albumin and α_2 and β_1 globulins was lower than that of normal serum, but that of γ and β_2 globulins was unchanged. Attempts to purify the virus with the aid of trypsin failed. Absorption spectrophotometry of sediment from ultracentrifuged serum with ultra-violet light revealed strong absorption at a wavelength of 260 mμ, which was absent from sediment of normal serum.—R.M.

PIERCY, S. E. (1956). **Recent progress in rinderpest vaccines research.**—*Bull. epiz. Dis. Afr.* **4,** 183-191. [French summary p. 226.] **1439**

The progress since 1949 in methods of immunization against rinderpest are reviewed. Dried lapinized vaccine is now extensively used for cattle, buffaloes, sheep and goats, but its mass production requires considerable care and the virus can become over-attenuated. One of its advantages is that batches can be screened for virus content in rabbits. In European breeds of cattle, immunity is believed to last at least 2 years. Unfavourable reactions have occurred in young calves and in certain hyper-susceptible breeds. The more potent goat virus vaccines may, under certain conditions, be used for cattle other than those indigenous to enzootic areas. The duration of immunity is life-long. Rinderpest virus can be maintained in fertile eggs and high titres obtained. Clinical reactions following the use of avianized rinderpest vaccines are negligible, but a temperature does occur and can be used to assess their efficacy. They are cheap and easy to produce. Inactivated rinderpest vaccines, although having the advantage of safety, have become less popular. A formolized spleen vaccine containing *Mycobacterium butyricum,* mineral oil and an emulsifying agent has produced immunity for 15–24 months, but it can cause severe local necrosis. Rinderpest virus has not yet been adapted to tissue culture.—A. ACKROYD.

SCHIPPER, I. A. & EVELETH, D. F. (1957). **Mucosal disease in calves.**—*Vet. Med.* **52,** 73-74 & 91. [Authors' discussion modified.] **1440**

The symptomatology and the pathology of a mucosal-like disease in calves were similar to the early stages of mucosal disease in older animals. Numerous reports by farmers during the past calving season indicate that the condition occurred widely in the North Dakota area. Many cases of peracute enteric and respiratory conditions in calves proved at P.M. examination to be mucosal-like conditions. Attempts to transmit the disease by feeding milk or administering blood or splenic emulsions to apparently susceptible calves were not successful.

DALE, C. N., ZINOBER, M. R. & TORREY, J. P. (1957). **Variations (variants) of hog cholera virus. IV. Comparative potencies of crystal-violet glycerol vaccines prepared from regular hog cholera virus and variant hog cholera virus.**—*Amer. J. vet. Res.* **18,** 112-118. [Authors' conclussions slightly modified. For previous parts, see *V.B.* **25,** 680 & 3645.] **1441**

Swine fever crystal violet glycerol vaccines prepared from regular virus may produce less protection against challenge with variant swine fever virus than against challenge with the regular virus. High quantitative titres of variant virus in defibrinated blood from pigs have not been obtained as uniformly as those of regular virus. This may account for difficulties encountered in producing as potent vaccines from variant virus as from regular virus.

STUART, E. E. & BANKOWSKI, R. A. (1957). **Propagation of vesicular exanthema virus on xenoplastic grafts.**—*Amer. J. vet. Res.* **18,** 109-111. [Authors' summary modified.] **1442**

The authors described a method for the propagation of four immunotypes of vesicular exanthema virus in embryonic pigskin grafted on to the chorioallantoic membrane of embryonating hen's eggs. Type B virus was carried through 67 serial passages, and types A, C, and D were passaged 8, 7 and 11 times, respectively. Sufficient virus was recovered from skin graft suspensions and the allantoic fluid of the inoculated eggs to produce extensive and generalized vesicular exanthema when inoculated into susceptible pigs, but the virus concentration was not satisfactory as an antigen for the direct complement-fixation test.

PUGH, R. J. (1956). **Chloramphenicol in virus pleuropneumonia of pigs.**—*Vet. Rec.* **68,** 1048-1049. [Abst. from author's summary.] **1443**

Of 220 pigs, 2–3 months old, which had been housed with pigs known to be affected with virus pneumonia, 70 were given i/m 35 mg./lb. body wt. of chloramphenicol daily for 3 days. Subsequent growth rates and incidence of coughing were similar in both groups. However, the treated pigs did not develop secondary pneumonia. It is concluded that early injection with chloramphenicol has no advantage over immediate treatment of secondary pneumonia with sulphadimidine, except where the incidence of secondary pneumonia is very high, or immediate treatment with sulphonamide is not possible.

FASTIER, L. B. (1956). **A complement-fixing antigen from egg-adapted canine distemper virus.**—*Nature, Lond.* **178,** 42-43. **1444**

The antigen was prepared from chick embryo chorioallantoic membrane. Non-specific activity was greatly reduced by adsorption of the crude membrane with a strongly basic anion-exchange resin, "Dowex-1"; it was completely abolished, without adverse effect on antigenicity, by heating at 56°C. for 15 min. The antigen was not anti-complementary, it did not precipitate when stored at 4°C., and, with short fixation, there were no false positive reactions such as occurred after overnight ice-box fixation.—T.E.G.R.

I. BOSGRA, O. & HOOGENDOORN, H. (1956). Enting en immuniteit bij hondeziekte en hard pad disease van fretten. **[Vaccination and immunity to distemper and "hard pad" disease in ferrets.]**—*Tijdschr. Diergeneesk.* **81,** 649-658. [In Dutch. English, French, German and Spanish summaries.] **1445**

II. BOSGRA, O. & HOOGENDOORN, H. (1956). De enting van nersten tegen infecties met distemper- en hard pad-virus. **[Vaccination of mink against distemper and "hard pad" disease.]**—*Ibid.* 659-666. [In Dutch. English, French, German and Spanish summaries.] **1446**

I & II. The dose of egg-adapted distemper virus required to immunize ferrets was 1/50—1/300th of the normal dose for a dog. Only some ferrets were immune after the inoculation of smaller doses. After storage of the virus vaccine in a refrigerator for 6 months, 1/200th of a dog-dose immunized ferrets but 1/600th did not. For mink 1/200th of a dog-dose was required. Double a dog-dose had no harmful effect on mink. In all experiments, immunity was tested by inoculation of virulent distemper virus 25 days after immunization.—R.M.

ANON. (1956). **Myxomatosis in Australia.**—*Nature, Lond.* **178,** 1219. **1447**

Although rabbit populations in Australia

are at present extremely low as a result of myxomatosis, the use of the poison 1080 (sodium fluoracetate), and recent climatic conditions, the conference to plan the country's myxomatosis campaign for the season recommended further large-scale inoculation with the standard myxomatosis virus strain of high virulence, as the less virulent strains have become predominant and the ultimate aim is the eradication of the rabbit from Australia. The French strain should not be introduced. Experiments have confirmed that rabbits can inherit—and are inheriting—some degree of resistance to myxomatosis.

—A. Ackroyd.

Kilham, L. (1956). **Propagation of fibroma virus in tissue cultures of cottontail testes.**—*Proc. Soc. exp. Biol., N.Y.* **92,** 739-742. [Abst. from author's summary.] **1448**

Two lines of Shope's fibroma virus were each carried through 14 serial passages in tissue cultures of cottontail rabbit testes. One line underwent 4 passages in cultures of domestic rabbit testes. Growth was accompanied by the formation of acidophile, intracytoplasmic inclusions and by vacuoles containing a mucin-like substance.

Gross, L. (1956). **Viral etiology of mouse leukemia.**—*Amer. J. Path.* **32,** 644-645. **1449**

Recent experiments have demonstrated that leucaemia in mice is caused by a filtrable, thermolabile agent, transmitted directly through the embryos from one generation to another. In most instances the agent causes no symptoms of disease and may pass through several generations of carriers before giving rise to leucaemia. The presence of the agent in mice can be determined by the inoculation of new-born, susceptible mice. Some of these mice will develop leucaemia after an interval varying from a few months to 1 or 2 years. The difficulty in understanding the nature of leucaemia in mice is increased by the observation that cell-free leucaemic extracts, injected into susceptible mice, may cause, instead of leucaemia, malignant tumours such as salivary gland carcinomas or soft tissue sarcomas.—M.G.G.

Placidi, L. & Santucci, J. (1956). Agglutination comparée des hématies de la poule, du chameau et des équidés par les virus de la maladie de Newcastle et de la peste aviaire. **[Agglutination of erythrocytes of the hen, camel, horse, donkey and mule by Newcastle disease virus and by fowl plague virus.]** —*Ann. Inst. Pasteur.* **90,** 528-529. **1450**

Fowl plague virus agglutinated the erythrocytes of all 5 species, but Newcastle disease virus agglutinated only those of the hen and camel.

—M.G.G.

Clark, D. S., Jones, E. E. & Ross, F. K. (1957). **Further studies with the aqueous humor of chickens as a reservoir for the virus of Newcastle disease.**—*Amer. J. vet. Res.* **18,** 204-206. [Authors' summary modified.] **1451**

Further studies with the hemagglutination (HA) test for Newcastle disease, using aqueous humor of chickens, are reported. The test, used on 995 routine diagnostic accessions of poultry, produced positive HA reactions in 83% of adult groups of birds and in 64% of the groups involving growing birds. The majority of HA-positive reactions could not be substantiated by hemagglutination-inhibition (HI) tests, and nervous signs characteristic of frank Newcastle disease were usually absent.

Disease conditions most often associated with positive reactions were reproductive disorders in adults and chronic respiratory infections in growing birds. Many positive reactions also occurred with other disease conditions.

Virus isolation studies, using aqueous humor from 127 HA-positive birds, resulted in isolation of a lethal strain of Newcastle disease virus in 111 instances (87%). It was concluded that the aqueous humor is a reservoir for the virus of Newcastle disease in a large percentage of chickens in southern California.

Macpherson, L. W. & Swain, R. H. A. (1956). **Strain differences in the Newcastle disease virus.** — *J. Hyg., Camb.* **54,** 234-245. [Authors' summary modified.] **1452**

A comparison of the biological characters of 8 strains of N.D. virus, isolated in different parts of the world between 1933 and 1951. Two types of virus were distinguished: one from Europe and Australia, the other from the U.S.A. Viruses of the first type were highly virulent, multiplied rapidly, and developed successively the properties of infectivity, haemagglutination, and haemolysis. Their haemagglutination pattern was constant and wide; they profoundly changed the antigenic structure of group O human r.b.c.; they were antigenically homogeneous.

Viruses of the second (U.S.A.) type were of weaker virulence. They grew more slowly in chick embryos; their haemagglutination pattern was reduced and the antigenic structure of group O cells was only slightly modified; they were also antigenically homogeneous.

Beaudette, F. R., Bivins, J. A., Burd, H. E. & Hudson, C. B. (1956). **Effect of passive**

immunity, mode of inoculation, and dose of virus on immunity response in bronchitis.—*Vet. Med.* **51,** 519-522. **1453**

In this experiment 16 birds were treated with immune serum and a day later inoculated with infectious bronchitis virus (8 by i/m inj. and 8 by the respiratory route). Six were kept as controls. The test birds were examined for virus during the 18 days after inoculation and swabs were taken during the following 16 days. During a period of 18 days after inoculation there was no serological response in either lot of test birds. The virus was present in swabs from 6 of the birds infected by the respiratory route but not in any from those inoculated i/m. All the test birds were challenged on the 18th day. All the birds inoculated i/m showed symptoms, the virus was recovered from 7, and, 16 days later, only one showed any appreciable immunity. The serological response to challenge in birds infected by the respiratory route was in marked contrast to that in the other test birds and virus was recovered from only one swab.

—T.E.G.R.

Bonar, R. A., Sharp, D. G., Beard, D. & Beard, J. W. (1956). **Identification of avian erythroblastosis virus by precipitation with chicken immune serum.**—*Proc. Soc. exp. Biol., N.Y.* **92,** 774-778. [Authors' abst. modified.] **1454**

Spheroidal particles about 100–120 mμ in diameter occur characteristically in the plasma of fowls with erythroblastosis. With formalin-inactivated concentrates of these particles, immune sera have been produced in fowls which neutralize the infectivity of the agent, and cause agglomeration of particles in concentrates identifiable by electron micrography as those found characteristically in this disease. The characteristic particles agglomerated are considered to be the viral agent of avian erythroblastosis.

Benedict, A. A. & McFarland, C. (1956). **Direct complement-fixation test for diagnosis of ornithosis in turkeys.**—*Proc. Soc. exp. Biol., N.Y.* **92,** 768-771. [Authors' summary modified.] **1455**

Turkey anti-psittacosis sera reacted to c.f. tests employing a soluble antigen. Antigens consisting of viable allantoic and killed yolk-sac virus suspensions did not show the same degree of activity. The direct was as sensitive as the indirect c.f. test; the use of the direct test was therefore suggested for the study and diagnosis of psittacosis in turkeys.

Weyer, F. & Lippelt, H. (1956). Ein Beitrag zur Frage der Tauben-Ornithose in Deutschland. [**Psittacosis in pigeons in Germany.**]—*Z. Hyg. InfektKr.* **143,** 223-246. **1456**

Eleven of 112 clinically healthy pigeons captured in Hamburg were carriers of psittacosis virus. Of 95 pigeons sent for examination from various parts of Germany, the virus was isolated from 30. Of 124 pigeons which were examined serologically, 31 had complement-fixing antibodies. I/p inoculation of the isolated strains into mice revealed that they were less pathogenic than strains from psittacine birds.—M.G.G.

Heath, H. D., Shear, H. H., Imagawa, D. T., Jones, M. H. & Adams, J. M. (1956). **Teratogenic effects of herpes simplex, vaccinia, influenza-A (NWS), and distemper virus infections on early chick embryos.**—*Proc. Soc. exp. Biol., N.Y.* **92,** 675-682. [Authors' summary slightly modified.] **1457**

Herpes simplex, vaccinia and influenza-A (NWS) viruses produced teratogenic and lethal effects in early chick embryos. The primary teratogenic effects of all 3 viruses were micrencephaly and axial flexion, but minor characteristic differences could be detected in embryos infected with each of these agents. Distemper virus failed to produce any gross embryological changes, although ulcerative lesions developed on the chorioallantoic membrane and the embryos died.

Syrůček, L. & Raška, K. (1956). **Q fever in domestic and wild birds.**—*Bull. World Hlth Org.* **15,** 329-337. [French summary. Synopsis modified.] **1458**

The authors examined blood samples from 572 domestic birds in an area of endemic Q fever in Czechoslovakia, and found positive reactions to the c.f. test in hens, turkeys, ducks, geese and pigeons—hens showing the highest percentage of positive reactions (15·9%). Susceptibility of hens to infection with *Rickettsia burneti* was demonstated; the organism appeared in the faeces of one hen from the 7th to the 40th day after infection. C.f. test with blood samples from 480 wild birds revealed positive reactions in 27 birds from infected farms, in 7 from the immediate vicinity of the farms, and in 2 living away from human habitations but in the endemic area. *R. burneti* was isolated from the spleen and liver of a redstart and a white wagtail and from ectoparasites of swallows.

Wissig, S. L., Caro, L. G., Jackson, E. B. & Smadel, J. E. (1956). **Electron microscopic**

observations on intracellular rickettsiae.—*Amer. J. Path.* **32,** 1117-1133. [Authors' summary modified.] **1459**

Ultra-thin sections of tissue from chick embryo yolk sacs infected with *Rickettsia mooseri* were examined under the electron microscope. The rickettsia were readily differentiated from normal intracellular constituents by their characteristic structure. *In situ* they were found only within the cytoplasm of mesothelial and epithelial cells, where they appeared to cause lysis of the submicroscopic cytoplasmic components; tissue reaction in the form of an inflammatory exudate was not observed. They appeared as dense, spherical or rod-shaped bodies about 250 mμ in width and up to 1·2 μ in length. Shadowed, washed *R. mooseri* had a granular core of protoplasm enveloped by an external limiting membrane. The protoplasm appeared less distorted when the rickettsia were fixed in suspension with osmic acid before shadowing.

See also abstr. **1625-1626** (reports, Australia).

IMMUNITY

Bauer, J. A., Peckham, P. E. & Osler, A. G. (1956). **Effect of fetal or neonatal immunization on antibody response of the adult rat.**—*Proc. Soc. exp. Biol., N.Y.* **92,** 714-718. [Authors' summary modified.] **1460**

Rats exposed to sheep erythrocytes before or at the time of birth had an undiminished capacity for haemolysin production in response to challenge with the same antigen 9 to 10 weeks later. It is suggested that the different results obtained by other workers [see *V.B.* **16,** 2272; **24,** 473, 3176; **25,** 2837] were the effects of immunological "paralysis."

Brierley, J. & Hemmings, W. A. (1956). **The selective transport of antibodies from the yolk sac to the circulation of the chick.**—*J. Embryol. exp. Morph.* **4,** 34-41. **1461**

Homologous antibody was shown to be absorbed from the yolk sac by the chick in the shell and from the retracted yolk sac after hatching, but not from the intestine. Absorption from the yolk sac was selective. Antisera prepared in the horse, ox and rabbit did not give rise to circulating titres. Pigeon antiserum was absorbed, though less readily than homologous antisera.—A. E. Pierce.

Abramoff, P. & Wolfe, H. R. (1956). **Precipitin production in chickens. XIII. A quantitative study of the effect of simultaneous injection of two antigens.**—*J. Immunol.* **77,** 94-101. **1462**

The antibody response in experimental groups of chickens to the simultaneous injection of bovine serum albumin and human γ-globulin at various concentrations, and to bovine serum albumin and bovine haemoglobin, was compared with that obtained in control groups of chickens injected with comparable amounts of any one of the antigens. Eight days after immunization the response in the experimental group receiving the combined albumin and γ-globulin was lower than that in the respective control groups. Antibody to γ-globulin appeared before that to albumin and reached a peak comparable with its control while the response to serum albumin was depressed. Antibodies to haemoglobin could not be detected in the experimental group receiving haemoglobin and albumin nor in the respective control group, but the haemoglobin exerted some effect in the experimental group exemplified by a lowered response to the albumin. The results are discussed with special reference to the different molecular weights of the antigens.—A. E. Pierce.

Landy, M. & Pillemer, L. (1956). **Increased resistance to infection and accompanying alteration in properdin levels following administration of bacterial lipopolysaccharides.**—*J. exp. Med.* **104,** 383-409. **1463**

The authors investigated the enhanced natural resistance of mice to Gram-negative organisms following the administration of bacterial lipopolysaccharide. Properdin levels, determined by zymosan [*V.B.* **25,** 2441] assay, were elevated following the injection of the lipopolysaccharide and such changes were shown to parallel changes in natural resistance to infection. The alterations produced in mice by the injection of lipopolysaccharides were of a complex nature, and the increased resistance to infection could result from the stimulation of defence mechanisms in addition to the properdin system.—A. E. Pierce.

Trumić, P. (1956). Eine neue Methode zur Ausführung der Komplementbindungsreaktion. **[A new method of performing the complement-fixation test.]**—*Zbl. VetMed.* **3,** 785-791. [English, French and Spanish summaries. English summary modified.] **1464**

The haemolytic property of dog complement can be used in the serological diagnosis

of dourine and glanders by using fresh dog serum for the c.f. test instead of g. pig complement and haemolytic amboceptor. As glycerol in the antigen inhibits the action of dog complement, the antigen should be preserved with 1% crystalline boric acid in normal saline. The antigen-antibody complex fixes the dog complement and thus inactivates the fresh serum in the sense that it no longer haemolyses sheep red cells. Dog complement shows a better titre when the mixture is kept in the refrigerator at 4°C. for 30 min. before the sheep red cells are added and then for an hour in a water-bath at 37°C. after they are added. Dog serum inactivated for sheep red cells cannot be reactivated by the addition of fresh g. pig serum.

Illés, E. & Balla, L. (1956). **Comparative analysis of immune sera by paper electrophoresis combined with serological tests.** — *Acta vet., hung.* **6,** 201-210. [In English. Russian summary.] **1465**

Immune sera from the hen, rabbit, g. pig, cow and horse were examined by paper electrophoresis. Antibodies to viruses, bacteria, and toxins were demonstrated in the eluted γ-globulin fraction. The quantitative distribution of the antibody was found to be similar when different serological tests were used. Antibodies were also demonstrated in the β-globulins of some species, while rabbit sera showed the greatest concentration of *Brucella* and *Salmonella*-O agglutinins between the β and γ-globulins. Tetanus antitoxin in horse serum was associated with the *T.* component. The immunization schedules were not given.

—A. E. Pierce.

Tolle, A. (1956). Der Stand der Blutgruppenforschung beim Rind. **[Research on blood groups in cattle.]**—*Berl. Münch. tierärztl. Wschr.* **69,** 406-410. [English summary.] **1466**

Of the 42 different haematological factors so far determined in cattle, 8 can be differentiated by normal antibodies, the remaining 34 only with immune antibodies.

Determination of blood factors is of great practical value in diagnosis of freemartins, progeny tests, and in the differentiation between monozygotic and two-egg twins as well as in ascertaining the inbreeding coefficient in cattle.

—F. K. Leeb.

See also absts. **1334** & **1336-1338** (TB.); **1342** (Johne's disease); **1347-1348** (swine erysipelas); **1350-1352** (pasteurellosis); **1355** (E. coli infection); **1370-1376** & **1378** (brucellosis); **1383-1384** & **1386** (leptospirosis); **1390** (V. fetus infection); **1396** (Coombs test); **1402** (bovine contagious pleuropneumonia); **1043** (caprine contagious pleuropneumonia); **1425** & **1427-1430** (F. & M. disease); **1432-1434** (rabies); **1439** (rinderpest); **1441** (swine fever); **1444-1446** (distemper); **1450** (Newcastle disease); **1453** (avian infectious bronchitis); **1454** (avian erythroblastosis); **1455** (ornithosis); **1493** (nematodes).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

Harding, W. C., Jr. & Quigley, G. D. (1956). **Litter treatment with malathion to control the chicken body louse.**—*J. econ. Ent.* **49,** 806-807. [Authors' summary modified.] **1467**

Malathion dust applied by hand at the rate of 0·5, 0·25, 0·2, or 0·1 lb. per 20 sq. ft. of dry litter gave excellent initial control of *Menacanthus stramineus* infestation of fowls. The application of 0·5 or 0·25 lb./sq. ft. controlled the lice for at least 5 weeks. A small handful of the dust was mingled with the nesting material of each nest. Malathion in contact with eggs did not affect hatchability, nor did it contaminate the interior of the eggs.

Cole, M. M. & Burden, G. S. (1956). **Phosphorus compounds as ovicides and adulticides against body lice.**—*J. econ. Ent.* **49,** 747-750. **1468**

Organic phosphorus insecticides are useful against many arthropod pests resistant to D.D.T. or other chlorinated hydrocarbons. The authors tested 73 such compounds *in vitro* against *Pediculus humanus.* In acetone solutions "parathion" was the most effective against the eggs, and "sulfotepp" the most efficient against adult lice. "Malathion" and "Chlorthion" hold promise for practical use in louse powders because of their low toxicity for mammals and high efficiency against both ova and adults.

—D. Poynter.

Thomas, P. L. (1956). **Prevention of blowfly strike in sheep.**—*N. Z. J. Agric.* **93,** 333-338. **1469**

This general article full of sound practical advice is addressed mainly to the sheep breeder in New Zealand. It provides a useful review of the problem.—D. Poynter.

Gordon, R. M., Crewe, W. & Willett, K. C. (1956). **Studies on the deposition, migration, and development to the blood forms of trypanosomes belonging to the *Trypanosoma brucei* group. I. An account of the process of feeding adopted by the tsetse-fly when obtaining a blood-meal from the mammalian host, with special reference to the ejection of saliva and the relationship of the feeding process to the deposition of the metacyclic**

trypanosomes.—*Ann. trop. Med. Parasit.* **50**, 426-437. [Authors' summary and conclusions slightly modified.] **1470**

A description is given of the feeding process by which the tsetse-fly obtains its blood-meal from the mammalian host, and of the techniques employed to observe the process. Recent observations show that the tsetse ejects saliva at frequent intervals during the whole process of probing the host's tissues, and that the saliva—and therefore any contained trypanosomes—is widely distributed in the host's tissues throughout a hemispherical area, the limits of which are represented by the range of the labium of the feeding fly. Indirect observations suggest that the saliva also seeps through the tissues to areas well beyond the actual injection site. When an adequate blood-supply has been tapped, the tsetse feeds with the labium, and therefore with the contained hypopharynx, in close apposition to the rent in a torn capillary. While taking up its meal from the outpouring stream of blood, the fly ejects saliva at frequent intervals, and it is reasonable to believe that some of the saliva, together with any contained trypanosomes, will find its way into the lumen of the torn capillary.

WEITZ, B. (1956). **Identification of blood meals of blood-sucking arthropods.**—*Bull. World Hlth Org.* **15**, 473-490. [French summary. Author's synopsis modified.] **1471**

The identification of blood ingested by blood-sucking arthropods requires a test which is sensitive enough to detect even partially digested blood and specific enough to identify the various hosts. The technique of preference is the precipitin test using the specific combination of the serum proteins of the blood. W. described the preparation of the extract from the specimen, the procedure for the absorption of the antisera and various methods of performing the precipitin test. When the hosts involved are closely related to each other, the inhibition test must be used. The blood specimen will specifically inhibit, under specified conditions, the agglutination of tanned and sensitized r.b.c. by a suitable antiserum. The procedure adopted for the identification of blood ingested by tsetse flies from a large variety of hosts is described.

BUSVINE, J. R. (1956). **The significance of insecticide-resistant strains: with special reference to pests of medical importance.**—*Bull. World Hlth Org.* **15**, 389-401. [French summary. Author's synopsis copied *verbatim*.] **1472**

The author discusses the meaning of insecticide resistance and the manner in which it should be detected and measured. From some recent data he gives a number of examples of measurements of resistance in mosquitoes of different species in various areas. He then proceeds to a speculative discussion on the way in which insecticide resistance arises, whether it can be prevented and overcome, its importance in the past and at present, and finally its future prospects.

ROULSTON, W. J. (1956). **The effects of some chlorinated hydrocarbons as systemic acaricides against the cattle tick, *Boophilus microplus* (Canestrini).**—*Aust. J. agric. Res.* **7**, 608-624. **1473**

Subcutaneous injections of lindane, dieldrin and aldrin at 25 mg./kg. body wt. in peanut oil produced marked effects on infestations of *B. microplus*. Re-infestations with larvae were prevented for up to 22 days with lindane, 25 days with dieldrin and 27 days with aldrin. Young adult ticks did not appear for up to 43, 67 and 80 days respectively with these three insecticides. D.D.T., toxaphene, diazinon and malathion at the same dosage rate had no systemic effects. Isodrin at 15 mg./kg. body wt. was also valueless while endrin at 10 mg./kg. body wt. was highly toxic to the host. Inunction of the neck with peanut oil solutions of lindane and dieldrin at 25 mg./kg. body wt. killed ticks over the entire body and prevented re-infestation for up to 11 and 21 days respectively.—F. H. S. ROBERTS.

NORRIS, K. R. & STONE, B. F. (1956). **Toxaphene-resistant cattle ticks (*Boophilus microplus* (Canestrini) occurring in Queensland.**—*Aust. J. agric. Res.* **7**, 211-226. [Authors' summary modified.] **1474**

B. microplus ticks on 4 herds in southern Queensland survived dipping in a tank charged with 0·5% wt./vol. toxaphene, which nevertheless disinfested a fifth herd. Periods during which toxaphene afforded protection against attachment of resistant larvae were much shorter than in the case of susceptible strains. Laboratory concentration-response tests on a culture of the toxaphene-resistant ticks indicated that the median lethal conc. of toxaphene for engorged females was 19 times higher than that for a reference strain and that for the larvae was also significantly higher. Toxaphene-resistant ticks on cattle were unaffected by spraying with 0·05% wt./vol. gamma-B.H.C. This was consistent with an earlier history of B.H.C. resistance in the ticks on these herds. Spraying trials indicated no marked arsenic resistance in the

toxaphene-resistant ticks. The mortality of the toxaphene-resistant ticks on cattle sprayed with 0·5% wt./vol. *pp*'-D.D.T. was as high, and the period of protection against larval re-infestation as long, as usually observed with other tick populations. A very high kill resulted from spraying the toxaphene-resistant ticks with 0·05% wt./vol. diazinon. Subcutaneous injections of peanut oil solutions of lindane, dieldrin, and aldrin at the rate of 25 mg. toxicant/kg. host body wt. were ineffective against toxaphene-resistant ticks.

HOFFMAN, R. A. (1956). **Control of the northern fowl mite and two species of lice on poultry.**—*J. econ. Ent.* **49,** 347-349. **1475**

"Lauseto neu," Bayer 21/199, Bayer L 13/59, Am. Cyanamid 4124, chlorthion and malathion, as 5% hand-dusting powders and lindane (1%) were effective against *Bdellonyssus sylviarum*; D.D.T. 5% was ineffective. Bayer L 13/59, chlorthion and malathion were also effective at a conc. of 2·5% for sprinkle-dusting. Malathion dust, 0·5% was effective against *Menacanthus stramineus* and *Menopon gallinae* on birds in individual cages. Malathion was also effective against *Bd. sylviarum* as a 4% dust at 4g./bird or as a 0·25–0·5% emulsion spray at 25ml./bird. Malathion dust for litter treatment against *Bd. sylviarum,* is considered effective at 4% at 1 lb./40 sq. ft. Lindane 1% and malathion, 4%, were each effective against *M. stramineus* and *M. gallinae* when applied at 1 lb./150 sq. ft. Chlorthion, 4%, was slightly less effective.

—T.E.G.R.

DINGLE, J. (1956). **Settling rates of D.D.T. and B.H.C. suspensions in cattle dipping baths.**—*Aust. vet. J.* **32,** 132-137. [Abst. from author's summary.] **1476**

A description is given of the preparation, sampling and maintenance of the chlorinated hydrocarbon dipping baths as well as a brief outline and discussion of the methods of analysis.

JEFFERIES, B. C. (1956). **Jetting sheep with dieldrin.**—*J. Dep. Agric. S. Aust.* **60,** 3-8 & 17. **1477**

In addition to recommendations for the "jetting" of sheep in South Australia, this general article gives details of the equipment, pumps, jet size and pressures.—M. D. MURRAY.

See also absts. **1380** (ticks as vectors of leptospirosis); **1529** (arthropod parasites in wild birds in Britain); **1625** (reports Australia).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

WRIGHT, C. A. (1956). **A note on the ecology of some molluscan intermediate hosts of African schistosomiasis.**—*Ann. trop. Med. Parasit.* **50,** 346-349. [Author's summary copied *verbatim.*] **1478**

The importance is shown of oxygen tension as a determining factor in the choice of microhabitats by fresh-water tropical snails, and two such microhabitats are described and discussed.

COKER, C. M. & LIGHTENBERG, F. (1956). **A revised method for isolation of *Schistosoma mansoni* eggs for biological experimentation.**—*Proc. Soc. exp. Biol., N.Y.* **92,** 780-782. [Authors' summary modified.] **1479**

A simple procedure is outlined for isolating eggs of *S. mansoni* from liver tissue by comminution, filtration, and sedimentation through a viscous medium (sucrose). The eggs retain their morphological integrity, hatchability, acid-fastness, ability to react with circumoval precipitins in immune serum, and ability to incite tissue reactions when injected into experimental animals. The procedure permits the separation of fully mature eggs from other types, and microscopic observation and some degree of control of the separation process.

HUNTER, G. W., JR., RITCHIE, L. S., LIN, S., PAN, C. & TANABE, H. (1956). **Immunological studies. I. Experiments with bird and human schistosomes in small mammals.**—*Exp. Parasit.* **5,** 551-559. **1480**

The dermatological response of mice, hamsters and rabbits to cercariae of *Gigantobilharzia sturniae* and *Schistosoma japonicum* was studied by two exposures within 14 days to the same parasite followed in about a month by another exposure to the same or alternate species. The skin was carefully examined both macroscopically and microscopically at exposed and non-exposed sites. Repeated exposure to *G. sturniae* cercariae produced an increase in sensitivity not noted with *S. japonicum.* Exposure to cercariae of *G. sturniae* followed by those of *S. japonicum* yielded no evidence of dermal sensitization or resistance. Repeated exposure to cercariae of *S. japonicum* followed by exposure to those of *G. sturniae,* produced less histological reaction than that seen in an experiment in which only *G. sturniae* cercariae were used, fewer parasites being seen in skin biopsy specimens. The results are suggestive of the existence of an immunological response.

—D. POYNTER.

GEMMELL, M. A. (1956). **Hydatid disease. With special reference to *Echinococcus granulosus* (Batsch, 1786) (Rudolphi, 1805) in the dog.**—*Aust. vet. J.* **32,** 252-255. [Abst. from author's summary.] **1481**

A survey of the incidence of *Echinococcus* in domestic animals revealed that up to 40% of all full-mouthed sheep on 60 to 70% of all properties in New South Wales were infested. Of 481 rural dogs employed in the pastoral and meat industries 128 harboured *E. granulosus,* the incidence being highest in dogs employed in rural abattoirs (38·1%). Of 447 dogs on 92 properties, 118 (26·4%) were infested, the highest incidence being in household pets, sheep dogs and cattle dogs (31·6, 29·7 and 27·3% respectively). A lower incidence was found in dogs used for rabbiting. Since 1926 there had been an increase (2·7 to 19%) in the incidence of *E. granulosus* in dogs used for rabbiting.

YAMASHITA, J., OHBAYASHI, M. & KONNO, S. (1956). **Studies on echinococcosis. III. On experimental infection in dogs, especially on the development of *Echinococcus granulosus* (Batsch, 1786).**—*Jap. J. vet. Res.* **4,** 113-122. [In English.] **1482**

In a study of the extent of morphological variation occurring within a single species of *Echinococcus,* 5 dogs [no details given] were each infected with about 1,000 scolices from a single large hydatid cyst from a ewe. The dogs were killed on the 16th, 17th, 35th, 135th and 375th days after infection. After fixing under pressure in 70% alcohol, the parasites were stained with carmine and haematoxylin. The species was determined as *E. granulosus.* Wide variation in size and shape of various organs was found at each stage of development and a progressive increase in size of these organs was found to occur with increasing age. At 16 days the average diameter of the rostellum was about one and a half times, and the size of the suckers about twice those of the hydatid scolices, but the hooks showed no increase in size. Between the 16th and 375th days the av. length of the strobila increased about eight times, the diameter of the rostellum about twice and the size of the hooks and suckers about one and a half times. These observations indicate the long period of experimental infection needed to obtain effective data for the differentiation of *Echinococcus* spp.—H. SCOTT MCTAGGART.

MATOFF, K. (1956). Kann eine Trichinellose durch Aufnahme von Darmtrichinellen zustande kommen? **[Production of trichinosis by ingestion of intestinal *Trichinella.*]**—*Wien. tierärztl. Mschr.* **43,** 705-730. [English, French and Italian summaries.] **1483**

Whole intestine, gut contents or mucosa were collected from trichinous mice, g. pigs and rats which had been killed between the 6th and 15th days after infection. At this stage only pregnant or parturient females are present in the intestine and infective larvae have not yet reached the muscles. As a result of being fed these materials 9 of 15 rats, 2 dogs, 2 of 7 g. pigs and none of 3 rabbits became infected with muscular trichinae. The feeding of material from g. pigs resulted in a greater degree of infestation than the feeding material from rats and mice.—H. SCOTT MCTAGGART.

MATOFF, K. (1956). Über das Passieren der Jungtrichinellen durch den Ductus thoracicus. **[Passage of trichinella larvae through the thoracic duct.]**—*Acta. vet., hung.* **6,** 333-342. [In German. Russian summary.] **1484**

Trichinella larvae were recovered from lymph in the thoracic duct of 5 out of 7 dogs infected 7 days previously.—R.M.

WEINER, L. M. & PRICE, S. (1956). **A study of antigenic relationships between *Trichinella spiralis* and *Salmonella typhi.*—*J. Immunol.* 77,** 111-114. **1485**

Rabbits negative to *T. spiralis* and *S. typhi* were immunized with *T. spiralis* larval antigen or *S. typhi* antigen. Anti-trichinella serum subsequently obtained reacted to a titre of 1:100 with typhoid "O" and 1:1000 with typhoid "H" antigens; and anti-typhoid serum reacted with trichinella larval antigen to a titre of 1:800. Absorption studies showed that these were true heterogenic reactions. Anti-trichinella serum also agglutinated *S. paratyphi A, B* and *C,* and *Klebsiella pneumoniae* antigens.—M.G.G.

WETZEL, R. & KERSTEN, W. (1956). Die Leberphase der Entwicklung von Strongylus edentatus. **[The liver-phase of *Strongylus edentatus.*]**—*Wien. tierärztl. Mschr.* **43,** 664-673. [English, French and Italian summaries.] **1486**

Six strongyle-free pony and donkey foals, 1–2 months old, were infected with 7,000 to 25,000 *S. edentatus* larvae by mouth. The pathological lesions and the stages of larval development observed when the foals were killed 6, 9, 11, 19, 36 and 66 days, respectively, after infection indicate that the larvae progress as follows: The third stage larvae burrow into the wall of the gut and reach the liver *via* the portal vessels. They become enclosed in nodules in the liver parenchyma and undergo the third moult

between the 11th and 18th days after infection. The fourth stage larvae wander for some time in the liver parenchyma, increasing considerably in size. They then migrate along between the peritoneal layers of the liver ligaments to reach the tissue underlying the parietal peritoneum. During the liver migration the larvae were found to be highly pathogenic, giving rise to various symptoms including colic, anaemia and loss of condition.—H. Scott McTaggart.

Gibson, T. E. (1957). **Critical tests of piperazine adipate as an equine anthelmintic.**—*Brit. vet. J.* **113,** 90-92. [Author's summary slightly modified.] **1487**

Critical tests of piperazine adipate in 2 foals revealed that at a dosage rate of 10 g. per 100 lb. body wt. the drug is 95% efficient in eliminating *Trichonema* spp., over 50% efficient against *Triodontophorus* spp., but of little value against *Oxyuris equi*.

Morgan, D. O. & Soulsby, E. J. L. (1956). **New records of nematodes in British cattle.**—*Vet. Rec.* **58,** 1029. **1488**

Cooperia macmasteri, C. punctata and *Nematodirus helvetianus* are recorded in British cattle for the first time. A list of nematodes occurring in the alimentary canal in British cattle is given.—D. Poynter.

Rohrbacher, G. H., Jr. (1957). **The recovery of nematode larvae by Baermann apparatus as affected by a detergent.**—*Proc. helm. Soc. Wash.* **24,** 24-25. [Author's summary modified.] **1489**

A slight modification of the Baermann technique is described. A non-ionic detergent added at the rate of 0·5 ml. per litre of water increased the recovery of infective larvae of cattle nematodes from Bermuda-grass, orchard grass, and crimson clover.

Alicata, J. E. & Wayman, O. (1957). **The effect of low-level and therapeutic administration of phenothiazine on the color of cow's milk.**—*Vet. Med.* **52,** 18-20. [Authors' summary modified.] **1490**

Phenothiazine given mixed with concentrate feed to 13 lactating cows for 12 days at the rate of 2 g. daily caused no discoloration of the milk of 12 whose average daily yield varied from 8·2 to 24·3 lb. However, with one cow, whose daily yield was reduced to 4·3 lb., a slight pink discoloration of the milk developed on the 8th day. When 60 g. phenothiazine was given as a drench to 4 cows yielding from 12·8 to 19·3 lb. of milk daily the milk was discoloured for 2 days, but resumed its normal appearance on the third day. It is concluded that low-level phenothiazine feeding may be used for dairy cows except when they are near the end of the lactation period. The value of this method is questionable except where there is risk of contamination of pasture for young-stock. Drenching of cows with phenothiazine at the therapeutic dosage causes discoloration of the milk.

Kreis, H. A. (1956). Beiträge zur Kenntnis parasitischer Nematoden. XIX. Parasitische Nematoden aus dem Indischen Elefanten-Elephas maximus L. **[Parasitic nematodes. XIX. In the Indian elephant.]**—*Wien. tierärztl. Mschr.* **43,** 751-760. [English, French and Italian summaries.] **1491**

Nematodes from the alimentary canal of 3 Indian elephants from a circus were identified as belonging to the already known species *Murshidia falcifera* and a new species which it was proposed to name *Quilonia sedecimradiata* and which was thought to have come from the caecum. Both species are described in detail with illustrative drawings.

—H. Scott McTaggart.

Levine, N. D., Bradley, R. E., Clark, D. T. & Kantor, S. (1956). **The relation of semi-weekly pasture rotation to acquisition of gastrointestinal nematodes by sheep.**—*J. Parasit.* **42,** No. 4.-Sect. 2. (Suppl.) p. 15. **1492**

In a pasture rotation experiment 9 infected ewes and their new-born lambs were moved twice a week on to fresh pasture. There were 12 fescue-lucerne pastures altogether. Egg counts were usually higher in these animals than in 18 controls kept on a single pasture and they grew more slowly, or even lost weight. After 5 months 2 of the 3 experimental lambs had died from parasitism.—M.G.G.

Soulsby, E. J. L. (1956). **Studies on the serological response in sheep to naturally acquired gastro-intestinal nematodes. I. Preparation of antigens and evaluation of serological techniques.**—*J. Helminth.* **30,** 129-142. **1493**

Antigens were prepared by a low-temperature method from various nematodes parasitizing sheep. Worms were placed in solid CO_2 at −79°C. and then subjected to alternate thawing at 4°C. and re-freezing for 5 times. Material obtained was emulsified, diluted 4 times with saline, centrifuged, and stored in solid CO_2. These antigens showed marked cross-reactivity and were satisfactory in complement-fixation tests. The passive haemagglutination test described by Boyden [*V.B.* **21,** 3620], in

which the r.b.c. are treated with tannic acid, gave higher titres than the c.f. test, using the same antigens. High antibody titres were observed in sheep naturally infested with nematodes, and a relationship between antibody titre and faecal egg count was demonstrated.—R.M.

DRUDGE, J. H., LELAND, S. E., JR. & WYANT, Z. N. (1957). **Strain variation in the response of sheep nematodes to the action of phenothiazine. I. Studies of mixed infections in experimental animals.**—*Amer. J. vet. Res.* **18,** 133-141. [Authors' summary modified.] **1494**

A comparison was made of the action of phenothiazine on two strains of sheep nematodes that were selected on the basis of flock history as representative of minimum (strain A) and maximum (strain B) contact with this drug. Treatment of experimentally infected lambs with small daily doses resulted in consistent and strikingly different responses between these strains. Thus, 0·5 g. of phenothiazine daily completely inhibited larval development and depressed egg counts by 65% in lambs infected with strain A; in contrast 1 g. and 2 g. daily were required for these same effects in lambs infected with strain B. Limited experience with therapeutic doses also indicated a lack of effectiveness against strain B nematodes which not only had a higher threshold to the drug than strain A but also appeared more tolerant than strains of sheep nematodes studied previously by other investigators. The present observations are in accord with the lack of effectiveness of phenothiazine in the strain B flock and suggest that the prolonged use of the anthelmintic has resulted in the development or selection of drug-resistant strains of nematodes.

OCCHIPINTI, G. (1956). Il cloridrato di emetina nella strongilosi polmonare ovina. **[Emetine hydrochloride in the treatment of lungworm infestation in sheep.]**—*Veterinaria. Milano.* **5,** 206. [English, French and German summaries.] **1495**

Affected sheep were treated with a 1% soln. of emetine hydrochloride injected i/m in the thigh. The dose was 3 ml./10 kg. body wt., repeated once or twice at intervals of 4 days, if necessary. A high percentage of recoveries is claimed.—T.E.G.R.

LINDQUIST, W. D. (1957). **The use of low level piperazine on pigs experimentally infected with *Ascaris lumbricoides*.**—*Amer. J. vet. Res.* **18,** 119-120. [Author's summary modified.] **1496**

One-tenth therapeutic dose (*i.e.*, 10 mg./kg. body wt.) of polymeric piperazine-1-carbodithioic acid given daily in the feed one week before, and 3 weeks after, infection failed to prevent migration of *A. lumbricoides* larvae. Respiratory embarrassment and liver scarring resulted, although no worms were recovered from the small intestines of any of the pigs.

MARTIN, H. M. (1957). **Studies on the anthelmintic value of 3,5-dimethyl-4-chlorophenol in dogs.**—*Proc. helm. Soc. Wash.* **24,** 67-69. [Author's conclusions modified.] **1497**

After fasting for 18 to 24 hours 14 dogs received orally 0·1 to 1 g./lb. body wt. of this compound. All except one of their 135 ascarids were expelled. Apparently all of 50 dogs eliminated their ascarids after receiving a single dose of 0·2 g./lb. body wt. after "over-night" fasting; worms were found in the faeces and later examination of the faeces was negative. Thirty of these dogs were killed and found free from helminths. In a third trial 29 dogs failed to pass all their ascarids when given 0·1 g./lb. body wt. immediately after a drink of milk but eliminated the remainder after receiving 0·5 g./lb. body wt. after a drink of milk. The data suggest that the compound is effective against ascarids in both fasted and fed dogs. A dog harbouring 390 hookworms expelled 53% of them after administration of 0·1 g./lb. body wt. The drug seemed to have no action on *Trichuris*. There was no evidence that it is toxic.

MORAN, J. F., JR. & MIZELLE, J. D. (1956). **Notes on the habitat and tissue-phase of *Ascaridia galli* (Schrank, 1788.).**—*J. Parasit.* **42,** No. 4.-Sect. 2. (Suppl.) p. 18. **1498**

Daily examination of chicks, each dosed with 800 infective eggs of *A. galli*, revealed that the last third of the intestine is a significant and previously unrecognized habitat of this parasite. The greatest concentration was in a section extending 3–5 inches on each side of the yolk-sac diverticulum. Immature *A. galli* were recovered from the mucus as late as 50 days after dosing.—M.G.G.

WHITLOCK, J. H. (1956). **A description of a new dog lungworm, *Filaroides milksi* n. sp. (Nematoda, Metastrongyloidea).** — *Wien. tierärztl. Mschr.* **43,** 730-738. [In English. French, German and Italian summaries.] **1499**

A new species of the genus *Filaroides* is described from the lungs of a dog. W. recognizes three genera in the subfamily Filaroidinae, Skrjabin 1953 namely *Metathelazia*, Skinker 1931; *Parafilaroides*, Dougherty 1946; and *Filar-*

oides, van Beneden, 1858. The hitherto unknown pathological condition of the lungs will be described in a subsequent communication by K. Jubb.—D. Poynter.

Micozzi, G. (1956). L'eleoforiasi negli ovini. [*Elœophora schneideri* **infestation in sheep.**] —*Zooprofilassi.* **11,** 441. **1500**

This is a brief note on a condition caused by the filarial nematode, *E. schneideri*, in sheep. In the adult stage the parasite is found in the arteries of affected tissues while in the microfilarial stage it occurs in the lesions in the skin, mouth, nostrils and conjunctiva. The skin lesions are 1–10 cm. in diam., they are denuded of wool and are covered with a thick crust of exudate and skin debris. Healed lesions leave bare, thickened patches of skin. Involvement of the coronary band causes deformity of the hoof. Skin lesions heal spontaneously in about 3 years (presumably the life span of the parasite in the tissues).—T.E.G.R.

Kerr, K. B. & Walde, A. W. (1956). **The anthelmintic activity of tetravalent tin compounds.**—*Exp. Parasit.* **5,** 560-570. **1501**

The authors tested, *in vivo*, 112 compounds and concluded that those of the type $R_2Sn\ X_2$ showed the most consistent anthelmintic activity against *Ascaridia galli* and *Raillietina cesticillus*. Three $R_3\ Sn\ X$ compounds were very active but $R\ Sn\ X_3$ and $R_4\ Sn$ compounds had little or no anthelmintic value.—D. Poynter.

Moegle, H. & Vercruysse, R. (1956). Eine Fall von Dermatitis verminosa beim Hund durch freilebende Nematoden. [**Dermatitis in a dog caused by free-living nematodes.**]—*Berl. Münch. tierärztl. Wschr.* **69,** 459-462. [English summary.] **1502**

Dermatitis in a bitch one-and-a-half years old, is reported as being due to third stage larvae of the free living nematode *Pelodytes strongyloides*. The lesions, on the lower parts of the thorax and abdomen and on the lateral aspect of the limbs, consisted of erythema with nodule and pustule formation. A second dog in the same enclosure was not affected. Larvae isolated from the pustules and the bedding were cultured *in vitro* through successive generations. The various stages of development are described in detail.—H. Scott McTaggart.

See also absts. **1364** (role of nematodes in bacterial infections); **1529** (helminths in wild birds in Britain); **1625-1626** (reports, Australia).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

Cotchin, E. (1956). **Neoplasms of the domesticated mammals. A review.** pp. 100. Review Series No. 4 of the Commonwealth Bureau of Animal Health. Farnham Royal, Bucks: Commonwealth Agricultural Bureaux. 20s. **1503**

A review with over 950 references, intended for those engaged in cancer research as well as the veterinarian. The neoplasms of each species of animal are classified under the body systems. Species variation in the incidence of certain neoplasms is discussed in the final chapter. The avian leucosis complex is not included because it was felt that this subject merited a review of its own. There is a bibliography and a subject index.—R.M.

I. Monlux, A. W., Anderson, W. A. & Davis, C. L. (1956). **A survey of tumors occurring in cattle, sheep, and swine.**—*Amer. J. vet. Res.* **17,** 646-677. **1504**

II. Monlux, A. W., Anderson, W. A. & Davis, C. L. (1957). **The diagnosis of squamous cell carcinoma of the eye (cancer eye) in cattle.**—*Ibid.* 5-34. [Authors' summaries modified.] **1505**

I. In a 2-year survey of tumours occurring in animals slaughtered at Denver, 1,002 tumours were collected: 908 from cattle, 66 from sheep and 28 from pigs. Of the bovine tumours, 722 were squamous-cell neoplasms of the eye; they occurred in 532 cattle. A diagnosis of squamous-cell carcinoma was made in 471 of the 722 eye tumours.

The comparatively frequent occurrence of adenocarcinoma of the uterus and lymphosarcoma in cattle, and their early fatal termination, made them both economically important. Schwann's cell and adrenal cortical tumours were common and relatively benign in cattle. Tumours in sheep and pigs were much less important than in cattle. Epithelial tumours were equal in occurrence to the non-epithelial tumours in sheep, but they were not found in pigs. Lymphosarcoma would appear to be the tumour of greatest economic significance in sheep and pigs. Embryonal nephroma was the commonest tumour found in pigs.

II. The 722 ocular squamous-cell tumours mentioned above were studied to determine their more distinctive patterns of growth and to establish a basis for their classification. The

tumours were bilateral in 52 out of the 532 cattle studied. It was proposed that benign ocular squamous-cell tumours be designated epidermal plaques or papillomas, and their malignant counterpart early squamous-cell carcinomas or squamous-cell carcinomas. A detailed study was made of 613 of the ocular tumours, using the most malignant neoplasm or group of neoplasms from each eye studied. The other 109 tumours were independent tumours of a more benign classification occurring as one or more additional growths on the affected eyes; they were not used as a source of data in the evaluation of the behaviour of individual ocular tumours. Of the 613 tumours, 471 were diagnosed as squamous-cell carcinomas, 30 as early squamous-cell carcinomas, 38 as epidermal papillomas, and 74 as epidermal plaques; 22 had metastasized to the parotid lymph nodes and four of these had additional metastatic lesions. There were 199 carcinomas which had ulcerated surfaces. Of 335 carcinomas involving the eye-ball, 67 had penetrated into the anterior chamber.

KAST, A. (1956). Die Epithelgeschwülste der ableitenden Harnwege bei den Haussäugetieren. **[Epithelial tumours of the urinary system in domestic animals.]**—*Mh. VetMed.* **11,** 483-490. **1506**

From a review of the literature, K. gave useful tabulations of data on epithelial tumours of the excretory part of the urinary tract in horses, cattle, dogs and pigs. He also gave an extensive account of the clinical and pathological features of tumours of the urinary bladder. To the 74 cases of epithelial tumours in the literature, he added four urinary bladder cases of his own: a transitional-cell papilloma of a dog; a squamous-cell carcinoma of a mare; a transitional-cell carcinoma, with metastases, in a mare; a transitional-cell carcinoma, with metastases, in a bitch. Of these 78 tumours, 61 were carcinomas of the urinary bladder: 34 in horses, 12 in cattle, and 15 in dogs.

—E. COTCHIN.

KEOWN, G. H. (1956). **Carcinoma in a stallion.**—*N. Amer. Vet.* **37,** 834. **1507**

A 12 year-old Thoroughbred stallion had a history of being unable to eat or drink for 5 days. An area of obstruction near the cardia of the stomach was detected by stomach tube. The animal died 8 days later, and P.M. examination revealed a large, necrotic, fibrotic and purulent mass in the cardia of the stomach, which had infiltrated the oesophagus, the fundus, and the liver. A histological diagnosis of squamous-cell carcinoma of the cardia was made.—E. COTCHIN.

BLACKWELL, R. L., ANDERSON, D. E. & KNOX, J. H. (1956). **Age incidence and heritability of cancer eye in Hereford cattle.**—*J. Anim. Sci.* **15,** 943-951. [Authors' summary slightly modified.] **1508**

The age incidence of bovine "cancer eye" (ocular squamous carcinoma) and the inheritance of susceptibility were investigated. Records of disposal complete enough for analysis of age incidence in one herd were available for the 21-year period from 1934–54 inclusive on 630 animals retained for at least one year. For inheritance studies, 415 of these animals from 209 dams and 31 sires were available. Cancer did not occur in animals leaving the herd before they were 4 years old. After the age of 4 years, cancer occurrence increased with age significantly more than would be expected if age and occurrence were independent. No sex difference in incidence was apparent.

A score for cancer eye susceptibility was developed on the plausible assumption that the more susceptible animals tend to develop lesions at younger ages. An estimate of heritability of cancer eye susceptibility derived from the parental half-sib correlation of these sources was 0·17. An estimate derived from the intra-sire regression of daughter's score on dam's score was 0·29. Other estimates based on regression of offspring on sire and dam, without scoring for age incidence, were 0·30 and 0·22, respectively. Possible biases in these estimates are discussed. Further studies on age incidence, predisposing causes, and hereditary aspects of cancer eye in cattle are needed.

SINGLETON, W. B. (1956). **An unusual neoplasm in a dog (a probable neurilemmoma of the caecum).**—*Vet. Rec.* **68,** 1046. **1509**

A Retriever dog, 8 years old at the time of operation, had for a period of 14 months shown intermittent bouts of lethargy, anorexia, mild pyrexia and occasional vomiting, and, more recently, stiffness of gait. Surgical removal was carried out of a centrally-cystic neoplasm, 12·5 x 10 cm., which was attached to the distal end of the caecum. Histologically, this was considered to be probably a neurilemmoma. The dog was in good health, with no evidence of metastases, a year later.—E. COTCHIN.

TRENTI, F. (1956). Aspetti radiologici dei tumori polmonari. **[X-ray appearance of pul-**

monary tumours in dogs.]—*Clin. vet., Milano.* **79,** 321-334. [English summary.] **1510**

Pulmonary neoplasia in dogs, its clinical manifestations and diagnosis are discussed. Radiological examination, though not entirely free from difficulties, is considered the best means of diagnosis. The technique and preparation of the patient for examination, the structural and functional alterations in affected tissue and interpretation of the radiographs are discussed. A detailed account of six cases is given. —T.E.G.R.

SCHNEIDER, H.-E. (1956). Bösartige Neubildungen als Ursache von einseitiger Otitis externa bei zwei Hunden und einer Katze. **[Malignant tumours as cause of external otitis in two dogs and a cat.]**—*Mh. VetMed.* **11,** 396-397. **1511**

Clinical and operative details are given of cases of otitis externa accompanied by neoplasia of the external auditory canal: in the dogs, an early squamous-cell carcinoma (successfully removed), and an early adenocarcinoma; in the cat, an adenocarcinoma.—E. COTCHIN.

LARSSON, B. (1956). **Autoradiography of dog mastocytomas.**—*Nord. VetMed.* **8,** 581-584. [In English. German and Swedish summaries.] **1512**

Sodium radiosulphate ($Na_2{}^{35}SO_4$) was given as a sterile aqueous solution intravenously to normal dogs, and to dogs bearing one or more mastocytomas. The rate of disappearance of radiosulphate from the blood was higher, but not significantly so, in the tumour-bearing dogs: in both groups, the radioactivity 24 hours after injection was about 20% of the initial value. Autoradiographs of mastocytomas removed operatively from the injected dogs (9 tumours from 5 dogs) showed that they took up radiosulphur: the uptake was much higher in the mast cells than in the connective tissue. Only slight uptake of radioactivity by a fibroma was demonstrable.—E. COTCHIN.

HUXLEY, J. (1956). **Cancer biology: comparative and genetic.**—*Biol. Rev.* **31,** 474-514. **1513**

This is a thought-provoking survey of cancer, considered, not as a medical problem, but as a biological phenomenon, by a distinguished biologist. It contains many suggestive ideas that would interest the veterinary reader who seeks to understand the nature of neoplasia in domesticated animals by setting it against the broad background of autonomous new growth in vertebrates, in invertebrates and in plants, and who would also like to read the views of an expert on such genetic aspects of cancer as species and racial differences, tumours due to genetic or chromosomal imbalances, and so on. There is a valuable discussion of evolutionary selection in relation to cancer. The article should be consulted in the original. —E. COTCHIN.

See also absts. **1529** (neoplasms in wild birds in Britain); **1626** (reports, Australia); **1627-1628** (books, cancer research).

NUTRITIONAL AND METABOLIC DISORDERS

TROUGHTON, A. (1955). **A comparison of three strains of white clover. Part II. Observations on bloat.**—*J. Brit. Grassl. Soc.* **10,** 297-305. **1514**

Pastures, each sown with one of 3 different strains of white clover, were grazed by cattle over a period of 3 years. The incidence of bloat was highest on the plots containing S. 100 clover (which grew the most profusely) and was lowest on the plots containing S. 184 clover (which grew the least densely). The incidence decreased markedly from year to year. More bloat occurred during the first 24 hours after animals had been moved on to fresh pasture than during subsequent 24-hour periods. There was more bloat on the lower-lying plots. These plots had a lower content of soluble P_2O_5 and K_2O in the soil.—M.G.G.

OSER, B. L. & OSER, M. (1956). **Nutritional studies on rats on diets containing high levels of partial ester emulsifiers. I. General plan and procedures; growth and food utilization.** —*J. Nutr.* **60,** 367-390. [Abst. from authors' summary and conclusions.] **1515**

The plan of a chronic feeding study is described in which rats were maintained for two years on nutritionally adequate diets supplemented with 5, 10 and 20% levels of partial ester emulsifiers or of hydrogenated vegetable oil. The emulsifiers were Myrj 45, Myrj 52, Span 60, Tween 60, Tween 65, Tween 80, and a mixture of all six. The growth of rats given emulsifiers at the 5 or 10% levels was not significantly different from that of controls; the only group with a significantly smaller gain than the corresponding vegetable oil group was that of

the males receiving 5% Tween 80. At the 20% level the males (but not the females) in all the groups receiving emulsifiers except in the one receiving Myrj 45 gained weight more slowly than controls; the 20% vegetable oil group, however, gained more than the controls. Data for food conversion efficiency showed no significant difference either among the groups receiving the various emulsifiers or between them and the control group—with one exception, namely a slightly but significantly lower efficiency in the rats receiving 20% Tween 60.

Fox, M. R. S., Ortiz, L. O. & Briggs, G. M. (1956). **Effect of dietary fat on requirement of vitamin B_{12} by the chick.**—*Proc. Soc. exp. Biol., N. Y.* **93,** 501-504. [Authors' summary modified.] **1516**

Incorporation of 20% fat into a diet of maize and soya-bean oil meal increased ten to twentyfold the vitamin B_{12} requirement of non-depleted chicks for optimal growth at 4 weeks of age. The requirement was between 50 and 100 mg. per kg. of diet compared with 0–5 mg. per kg. of the diet containing 3% fat. The high dietary fat did not deplete the chick of its vitamin B_{12} reserves in the liver or alter the absorption of the vitamin and its subsequent storage in the liver.

Marnay, C., Prelot, M. & Raoul, Y. (1956). Activité hypercalcémiante sur le chien normal ou thyroparathyroïdectomisé d'une fraction lipidique extraite des glandes parathyroïdes. **[Hypercalcaemia following the administration to dogs of a lipid fraction extracted from parathyroid glands.]**—*C.R. Acad. Sci., Paris.* **243,** 681-683. **1517**

Lipid extracts of parathyroid glands were injected s/c into normal dogs and into dogs from which the parathyroids had been removed 24–48 hours previously. Hypercalcaemia developed after 3–8 hours, the general condition of the treated animals improved and tetanic spasms ceased.—M.G.G.

Johnson, D., Jr. & Fisher, H. (1956). **The amino acid requirement of the laying hen. II. Classification of the essential amino acids required for egg production.**—*J. Nutr.* **60,** 275-282. [Abst. from authors' summary.] **1518**

Arginine, glutamic acid, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan, valine, but not glycine, were found to be essential for egg production. This is in contrast with the need of the growing chick for glycine.

Baker, N. F. & Douglas, J. R. (1957). **Plasma iron and iron-binding capacity in lambs.**—*Amer. J. vet. Res.* **18,** 142-146. [Authors' summary modified.] **1519**

The iron content of the plasma of lambs increased from a mean of 133 to 193 μg./100 ml. between the ages of 8 and 12 months. Since no change occurred in the total iron-binding capacity this increase in plasma iron increased the saturation of "transferrin" (iron-globulin complex) with iron, from 40 to 58%.

It is tentatively concluded that lambs may show diurnal fluctuation in plasma iron when undisturbed, but this can not be depended upon when they are maintained under experimental conditions.

Loewenthal, L. A. (1956). **Effects of vitamin A deficiency on skin and hair growth in mice.**—*J. Morph.* **98,** 275-303. **1520**

Plucked hairs were replaced more slowly in mice deficient in vitamin A than in control mice. The hair growth cycle frequently lasted 24 days, compared with 21 days in the controls. Histological examination of the skin revealed no abnormalities.—M.G.G.

McClymont, G. L. & Reis, P. J. (1956). **Vitamin D supplements for lambs in Southern New South Wales.**—*Agric. Gaz. N.S.W.* **67,** 251-253. **1521**

In short-term experiments with autumn born lambs no benefit accrued in live weight gain after s/c injections of vitamin D (in doses ranging from 700,000 to one million i.u.) over periods ranging from 42 to 121 days. The test groups, which included unweaned Merino and Corriedale lambs, and Corriedale wether hoggets, 14 to 15 months old, were grazed on native pasture, green oats and on a mixture of these.

—M. C. Franklin.

Gillman, J. & Gilbert, C. (1956). **Periarteritis and other forms of necrotising angeitis produced by vitamin D in thyroxinised rats with an assessment of the aetiology of those vascular lesions.**—*Brit. J. exp. Path.* **37,** 584-596. [Survey of paper (pp. i-ii), slightly modified.] **1522**

The authors described 4 types of arteritis and one of phlebitis which may develop rapidly after 5 days' administration of large doses of vitamin D to rats. Treatment with thyroxin aggravated the lesions: previous thyroidectomy or treatment with cortisone diminished their severity. These changes are likened to others produced experimentally in animals, and to some occurring in man. It is suggested that the

mechanism underlying all these conditions may be a derangement of renal function involving the metabolism of calcium and phosphorus.

NOBEL, T. A. (1956). **[Stiff lamb disease.]**—*Refuah vet.* **13,** 76. In Hebrew. [English summary (p. 98) modified.] **1523**

The first case of "stiff lamb" disease in Israel is reported. The clinical picture and gross microscopic pathology are described.

RINEHART, J. F. & GREENBERG, L. D. (1956). **Vitamin B_6 deficiency in the rhesus monkey, with particular reference to the occurrence of atherosclerosis, dental caries, and hepatic cirrhosis.**—*National Vitamin Foundation Inc. Nutr. Symposium Ser.* No. 12. pp. 10-17. Discussion: pp. 17-20. **1524**

A discussion of recent work, with illustrations of lesions. [See also *V.B.* **21,** 2341.] —R.M.

JARRETT, I. G., POTTER, B. J. & PACHAM, A. (1956). **Effects of pancreatectomy in the sheep.**—*Aust. J. exp. Biol. med. Sci.* **34,** 133-142. **1525**

Complete pancreatectomy in sheep resulted in hyperglycaemia in all cases, but severe ketosis occurred in some cases only. Severe ketosis was difficult to control with insulin and affected sheep died within 3 months. Those with mild ketosis required little insulin and maintained reasonable body condition without it. Elimination of pancreatic exocrine secretion by severance of the pancreatic duct caused no discernible variation in body wt. or wool growth. —D. C. BLOOD.

MOODIE, E. W. (1956). **Biochemical aspects of bovine parturient paresis.**—*Aust. vet. J.* **32,** 162-165. **1526**

Plasma from cows expected to calve in a few days and from cows just calved was injected into lambs. No change in the serum calcium of the lambs occurred as a result of the transfusion. There appeared to be some relationship between the phosphate concentration of the injected plasma and a change in the lambs' plasma phosphate levels 24 hours later.—D. C. BLOOD.

See also absts. **1360** (effect of dietary enterococci and chlortetracycline hydrochloride on intestinal flora and growth in chicks); **1625** (report, Australia).

DISEASES, GENERAL

HARNETT, P. (1956). **The significance of veterinary science in the national economy.**—*Irish vet. J.* **10,** 130-142; 164-172; 185-188. **1527**

H. attempted to assess losses of livestock from disease in the Republic of Ireland. Figures were given for mortality in general and mortality from specific diseases in cattle, sheep, horses, pigs and poultry, mainly for the year 1954. In concluding, H. stated that during that year losses could be valued at £30 million.—R.M.

LUTYŃSKI, W. (1956). Nowy wykaz chorób zawodowych. **[Official list of professional diseases in Poland.]**—*Méd. vét., Varsovie.* **12,** 735-736. [In Polish.] **1528**

According to Polish law persons incapacitated by accidents or professional diseases are entitled to a pension provided their employment is connected with that risk. The official list of professional diseases comprises four groups: (1) Diseases of animal origin: brucellosis, tularaemia, rabies, leptospirosis (Weil's disease), tetanus, glanders, anthrax; (2) Infectious diseases acquired in connexion with work; (3) Actinomycosis in agricultural workers; (4) Diseases caused by exposure to X-rays in the course of duty.—M. GITTER.

MCDIARMID, A. (1956). **Some diseases of free-living wild birds in Britain.**—*Bull. Brit. orn. Cl.* **76,** 145-150. **1529**

The author reviewed the scanty literature on this subject and reported his own observations on TB., *Past. pseudotuberculosis* infection, "paracolon" infection, *B. pyocyaneus* infection, aspergillosis, *Trichomonas columbae* infection (in wood-pigeons), neoplasms, and diseases caused by arthropod and helminth parasites. [See also *V.B.* **20,** 16; **24,** 1128; **25,** 592 & 3983.]—R.M.

DIMIC, J. M. (1956). Beitrag zur Therapie der periodischen Ophthalmie bei Pferden durch das Injizieren von Antibiotika in die vordere Augenkammer. **[Treatment of periodic ophthalmia in horses by injection of antibiotics into the anterior chamber of the eye.]** —*Tierärztl. Umsch.* **11,** 429-433. **1530**

"Omnacillin" (suspension of Novocaine-penicillin in concentrated "Omnadin" solution) and "Omnamycin" ("Omnadin" with penicillin and dihydrostreptomycin), injected into the anterior chamber of the eye at a dosage of 30–50,000 units was rapidly absorbed without producing contraction of the pupil. Corneal opacity, produced by the antibiotics, was

moderate and disappeared after 2–3 days. This local treatment, supported by i/m or s/c injection with these two antibiotic combinations, at the rate of 1,950,000–1,970,000 units, gave satisfactory results in the treatment of periodic ophthalmia in 43 horses; there was only occasional recurrence during an observation period of 6–12 months after treatment.
—F. K. Leeb.

Pellegrini, L. (1956). Ricerche sul pH sanguigno dei cavalli affetti da bolsaggine. **[pH of the blood in horses with "broken wind".]**—*Clin. vet., Milano.* **79,** 241-246. [English summary.] **1531**

The pH of the blood of broken-winded horses, at rest and after light work, did not vary from that of normal horses.—T.E.G.R.

Kalchschmidt, H. G. & Winter, H. J. (1956). Die Hauttemperaturverhältnisse am Thorax und im Lendenbereich des klinisch gesunden Rindes und ihre Eignung zum Nachweis Headscher Zonen. **[Skin temperature on the thorax and loins in clinically healthy cattle and in regions of referred pain in the foreign body syndrome.]**—*Tierärztl. Umsch.* **11,** 365-370. **1532**

The authors confirmed the observation of Sagner [*V.B.* **26, 1744**] that in cattle with traumatic reticulitis the skin temp. in the region of referred pain over the thoracic vertebrae was often 2° to 3°C. lower than at other parts of the thoracic and lumbar regions.—R.M.

Rooney, J. R., Jr. (1957). **Paper electrophoresis of bovine serum.**—*Amer. J. vet. Res.* **18,** 67-72. [Author's summary modified.] **1533**

A system for the paper electrophoretic analysis of bovine serum was based on a five-hour run at 21 milliamps. constant current, using a veronal buffer system having an ionic strength of 0·053 μ. The hanging strip cell and Whatman 3 mm. filter paper were used. Examples of abnormal bovine serum protein patterns were discussed.

Weber, A. F., Pritchard, W. R. & Sellers, A. F. (1956). **Studies of the bovine adrenal gland. I. The production of lipid accumulation and other histological and cytological changes in the zonae glomerulosae of calves.**—*Amer. J. vet. Res.* **17,** 402-409. **1534**

Fatty infiltration and degenerative changes in the zona glomerulosa of the adrenal glands have been observed in ketosis of cattle and sheep. The authors produced similar changes in calves by i/v inj. of 5% NaCl soln., 250–500 ml. once every 4 hours for 24–48 hours, or by i/m inj. of 30 mg. deoxycortone acetate once every 4 hours for 24–48 hours. These treatments did not cause any change in the thickness of the zone.—R.M.

Rooney, J. R., Jr. (1956). Ödem-sjuka hos svin. **[Oedema disease in pigs.]**—*Medlemsbl. Sver. VetFörb.* **8,** 376-378. [In Swedish.] **1535**

A brief general review of the disease for Swedish workers. Only 4 cases have been diagnosed at the Royal Veterinary College, Stockholm (2 in 1952 and 2 in 1956), but the true incidence is probably higher than these figures would indicate.—F.E.W.

Christensen, E. & Christensen, N. O. (1956). **Studies on "trembling in new-born pigs".** Preliminary report.—*Nord. VetMed.* **8,** 921-934. [In English. German and Danish summaries. Authors' summary modified.] **1536**

The symptomatology of "trembling" in new-born pigs is described, and a synopsis of the literature is given. Eleven pigs with varying symptoms of the disease, from 3 herds, were subjected to clinical and P.M. examination. Histological study of the c.n.s. revealed incomplete development of the myelin sheaths in most of the pigs. Unaffected pigs of the same age had normal myelin sheaths. No other pathological changes in the c.n.s. were observed. It is concluded that the morphological and neurophysiological basis for the disease is a retarded development of the myelin sheaths. An investigation in one of the herds indicated that the disease is caused by incorrect feeding during gestation. No basis was found for believing the disease to be either hereditary or due to virus infection.

Dyce, K. M. (1956). **Veterinary radiology (myelography).**—*X-Ray Focus,* **1,** No. 3. pp. 6-7. **1537**

Myelography in dogs can assist the diagnosis of pressure on the spinal cord by a protruding intervertebral disc. Contrast medium is usually injected at the atlanto-occipital articulation. The type of needle employed is important. Of the 3 media which the author has used "Myodil" appears to be the most suitable; iodized oil does not mix with the cerebrospinal fluid and "Thorotrast" is both irritant and radioactive.—M.G.G.

Frost, R. C. (1956). **Cholecystography and rupture of the diaphragm in small animals.**—*Vet. Rec.* **68,** 1014. [Author's summary modified.] **1538**

A technique of cholecystography in cats and

small dogs is described. Its value in the diagnosis of ruptured diaphragm is indicated.

LARSEN, A. E. (1956). **Breeding and disease problems of mink.**—*Vet. Med.* **51,** 273-276. **1539**

Mating takes place between the end of February and the first few days of April. Two matings at an interval of 7–9 days are considered to produce larger litters. Mating at any other time is likely to interfere with the cycle and there may be no kits born. The period of gestation varies from 40 to 70 days. Some of the causes of infertility are briefly discussed. The common diseases of mink are distemper, botulism, streptococcal septicaemia, gastro-enteritis (due to various causes), heat exhaustion and "nursing anaemia". The last mentioned condition is characterized by extreme loss of weight and high mortality, especially among females with large litters; the cause is unknown but NaCl imbalance is suspected.—T.E.G.R.

MARTHEDAL, H. E. (1956). Forekomst af multiple blødninger (haemorrhagisk syndrom) hos fjerkrae. **[Multiple haemorrhages (haemorrhagic syndrome) in fowls.]**—*Medlemsbl. danske Dyrlaegeforen.* **39,** 609-616. [In Danish.] **1540**

M. discussed the diagnosis, differential diagnosis and aetiology of the condition known as the haemorrhagic syndrome of fowls, first reported by R. F. Gordon (1951) in England [*Xth World's Poult. Congr., Paris,* p. 95] and later in the U.S.A. [*V.B.* **25,** 1443]. In Denmark, multiple haemorrhages were found in 80 specimens examined in 1954 and in 123 in 1955 [totals not given]—usually in association with the use of sodium sulphabenzpyrazine (sulphaquinoxaline); and tests with young chickens indicated that similar lesions could be produced by 0·05% sulphaquinoxaline in the drinking water for 8–14 days, but not by 0·0125% of the drug given mixed with the mash continuously, starting from day-old up to the age of 3 months. M. emphasized that, because of the divergent results obtained in toxicity tests, the drug should be used with care. He recommended a dosage scheme for use in acute caecal coccidiosis. He pointed out that sulphonamides are contra-indicated where hepatitis [*V.B.* **24,** 2441] is present.—F.E.W.

RUGH, R. (1956). **Effect on suckling young of X-irradiation of lactating mother.**—*Proc. Soc. exp. Biol., N. Y.* **93,** 523-524. [Abst. from author's summary and conclusions.] **1541**

The young of X-irradiated lactating mice were stunted, the higher the dose the greater the stunting. There was no evidence of any toxic substance in the milk. The effect appeared to be one of simple starvation, probably through general debilitation of the mothers. The young recovered rapidly when given to normal lactating mice at 15 days of age, and by 30 days they weighed as much as controls.

BUSTAD, L. K., GEORGE, L. A., JR., MARKS, S., WARNER, D. E., BARNES, C. M., HERDE, K. E. & KORNEBERG, H. A. (1956). **Biological effects of I^{131} chronically administered to sheep.**—*Radiation Res.* **5,** 472. **1542**

The clinical manifestations of radiation damage in ewes fed 240 or 1800 μc of I^{131} daily included lethargy, clumsy movements, constipation, bloating, diminished milk secretion, and dry skin and fleece. A depression in leucocyte count and protein-bound iodine and an increase in non-protein nitrogen and creatinine values were also observed. The first-year offspring of ewes fed 240 μc daily had decreased haemoglobin and serum calcium and increased inorganic phosphorus values. Slow growth, variable alopecia, and calcified plaques in the blood vessels were also seen. All except 2 ewes fed 5 μc of I^{131} daily for 3–4 years had histopathological lesions of the thyroid and a significant reduction in the size of the gland. No damage was observed in ewes fed 0·15 μc daily for 4 years or in their offspring fed 0·15 μc for 5 years. This feeding level gave a thyroid dose of about 3 rads weekly.—M.G.G.

SHAW, J. H. & GUPTA, O. P. (1956). **The relation of a chelating agent to smooth-surface lesions in the white rat.**—*J. Nutr.* **60,** 311-322. [Abst. from authors' summary.] **1543**

Ethylene diamine tetraacetic acid (EDTA), when added to a high sucrose cariogenic diet, produced lesions on the smooth surfaces of the molar teeth of white rats, which grossly resembled simple decalcification. The incidence and severity of these lesions increased in proportion to the conc. of EDTA in the diet. EDTA failed to produce this type of lesion when added to a non-cariogenic diet free from carbohydrate and rich in protein and fat. The lesions appeared, therefore, to be closely related to or identical with smooth surface caries rather than to be the result of simple decalcification of the tooth substance by chelation.

MAZURCZAK, J. & TOMICKI, Z. (1956). Zastosowanie modyfikacji chromatograficznej proby galaktozowej w diagnostyce weterynaryjnej. **[A modified chromatographic**

galactose test for liver function.]—*Méd. vét., Varsovie.* **12,** 669-672. [In Polish. English and Russian summaries.] **1544**

A 30% solution of galactose was given i/v to dogs in doses of 0·5–1 g./kg. body wt. Blood samples were taken at 15, 30, 45, 60, 90 and 120 min. after the injection. After extraction of proteins and sugars the samples were transferred on to Whatman No. 1. filter paper. A mixture of n-butanol, pyridine and distilled water in proportion 5:3:1 was used as solvent. Chromatograms were stained with silver nitrate. In normal dogs no traces of galactose were seen on chromatograms after 60 min. In dogs with depressed liver function, galactose was present in blood samples collected 90 and 120 min. after injection.—M. Gitter.

Dyce, K. M. (1956). **An experimental study of the biliary tract of the dog.**—*Zbl. VetMed.* **3,** 717-726. [In English. French, German and Spanish summaries. Author's summary modified.] **1545**

The radiographic visualisation of the biliary tree after i/v inj. of "Biligrafin" [an organic iodine compound] was studied in 18 healthy dogs. The development of the image and the radiological anatomy are described. The gall-bladder and major ducts were well shown in every case but the demonstration of the intra-hepatic ducts was more variable. The possible clinical and experimental applications of the method are briefly discussed. [See also *V.B.* **26, 3957.**]

Monti, F. (1956). La semiologia del sistema nervoso negli animali domestici. [**Symptomatology of the nervous system of domestic animals.**]—*Vet. ital.* Suppl. No. 3. pp. 577-763. **1546**

An extensive account, divided into chapters on the anatomy, physiopathology and symptomatology of the nervous system. There are 30 illustrations of animals with postures characteristic of various nervous disorders.—R.M.

McGeown, M. G. & Bull, G. M. (1957). **The pathogenesis of urinary calculus formation.**—*Brit. med. Bull.* **13,** 53-57. [Authors' summary copied *verbatim*.] **1547**

Conditions which are frequently associated with calculus formation are reviewed. It is significant that stones can occur in the absence of all of them. The part played by these conditions is probably of secondary importance. The current hypothesis that stone formation is due to a deficiency of some substance which holds calcium in solution in normal urine, or to an excess of some substance with which calcium forms an insoluble complex, cannot be regarded as proved. The prophylaxis against recurrences of calculi after their surgical removal rests upon the maintenance of a high fluid intake, and the treatment of coexisting urinary infection.

POISONS AND POISONING

Markiewicz, K. (1956). Wartość próby galaktozowej w ocenie stanu czynnościowego wątroby u psów zdrowych i zatrutych talem. [**Examination of the liver in normal and thallium-poisoned dogs by the galactose test.**]—*Méd. vét., Varsovie.* **12,** 724-726. [In Polish, English and Russian summaries.] **1548**

In healthy dogs, blood levels of reducing substances returned to normal within 60 min. after the injection of galactose as against 121 min. in thallium-poisoned dogs. The results of the galactose test were confirmed by histopathological examination, which revealed liver damage in the thallium-poisoned dogs.

—M. Gitter.

Martinsons, E. (1956). Undersøkelser over forekomsten av basofile punktasjoner i de røde blodlegemer hos mink, kidd og gris ved forøkede mengder bly per os. [**Occurrence of punctate basophilia of erythrocytes in lead poisoning of mink, kids and a pig.**]—*Nord. VetMed.* **8,** 689-700. [In Norwegian. English and German summaries.] **1549**

Punctate basophilia in mature erythrocytes was observed in mink given 1 mg. or more of lead daily, but was not observed in 3 kids and a pig with lead poisoning. In mink it was distinguished from the more diffuse basophilia occurring in polychromatic (immature) erythrocytes in anaemia provoked by aniline or other agents. Blood smears were stained with Manson's methylene blue at pH 7 and examined by dark-field microscopy.—R.M.

Boyd, P. R., Walker, G. & Henderson, I. N. (1957). **The treatment of tetraethyl lead poisoning.**—*Lancet.* **272,** 181-185. [Authors' summary slightly modified.] **1550**

Four non-fatal cases of tetraethyl lead poisoning in man are described. The urinary lead excretion of the three studied in detail was increased sevenfold by edathamil $CaNa_2$ or penicillamine given by mouth. One patient, who was maniacal, hallucinated and deluded,

responded dramatically to electroconvulsion therapy.

WHITEHEAD, E. I. (1956). **Nitrate poisoning.**—*S. Dak. Fm Home Res.* **7,** 70-73. **1551**

Fatal nitrate poisoning is reported in 26 cattle fed oat hay containing 5·9%, and in 17 fed sudan grass containing 4·9% potassium nitrate. A content of 1·5% in forage is considered to be toxic for ruminants. A high content may be caused by drought, short periods of daylight, trace element deficiency, and improperly applied herbicides. Sugar beet treated with a spray containing KNO_3, and left to grow in a dim light had a much higher content of KNO_3 than control plants. Blood samples were taken regularly from 3 sheep given water containing up to 0·9% KNO_3. A few samples contained methaemoglobin, but only in small amounts.—M.G.G.

HALL, W. T. K. (1956). **A note on *Macrozamia* and *Xanthorrhoea* poisoning of cattle.**—*Aust. vet. J.* **32,** 173-175. **1552**

Experimental feeding of cattle with leaves of *Macrozamia spiralis, M. paulo-guilielmi* and *M. douglasi* produced symptoms of incoordination and weakness of the hind legs. In the early stages there was over-extension of hind legs followed later by incomplete extension. The forelimbs were never affected. Lesions were not evident in the spinal cord at P.M. examination. The green leaves of the plant are more toxic than dried leaves. Complete recovery does not occur.

Feeding of the spikes of the swamp grass tree (*Xanthorrhae hastile*) to two heifers produced symptoms of a naturally occurring disease. Incoordination and weakness of the hindquarters caused lurching from side to side, often to the point of spinning around on the front legs or falling heavily on the side. Lateral flexion of the spine and urinary incontinence also occurred. Complete recovery occurred when feeding of this material was stopped.

—D. C. BLOOD.

WATSON, E. R. (1956). **An outbreak of phalaris staggers in sheep at Kojonup, Western Australia.**—*J. Aust. Inst. agric. Sci.* **22,** 209-211. **1553**

Oral dosing with a solution of cobalt sulphate (4·5 mg. every two days) did not prevent the development of symptoms nor alleviate existing symptoms of phalaris staggers in a spontaneous outbreak in a small group of sheep.

—D. C. BLOOD.

CASTELLANI, A. & TORLONE, V. (1956). **Pathological aspects of photodynamic lesions of the skin.**—*J. Path. Bact.* **72,** 505-514. [Authors' summary modified.] **1554**

Rats sensitized with haematoporphyrin, phylloerythrin or hypericin and exposed to light showed change of chromotropia of their dermal acid polysaccharides from metachromasia to orthochromasia. In the presence of haematoporphyrin, phylloerythrin or hypericin the viscosity of hyaluronic acid derived from umbilical cord or from synovial fluid became progressively lower during irradiation *in vitro* with white or filtered light. The phenomenon took place exclusively in the presence of oxygen. Light alone and photodynamic substances in the dark had no effect. The oxidative character of the phenomenon distinguishes the photodynamic degradation of hyaluronic acid from its enzymic breakdown. The depolymerization of hyaluronic acid obtained *in vitro* explains the alteration of chromotropia in the rats. This depolymerization may possibly be the primary phase in the pathogenesis of cutaneous lesions in photodynamic disease.

ANON. (1956). **Toxaemic jaundice of sheep: phytogenous chronic copper poisoning heliotrope poisoning, and hepatogenous chronic copper poisoning. Final report of the Investigation committee.**—*Aust. vet. J.* **32,** 229-236. **1555**

The investigation has shown that the disease of sheep known formerly as toxaemic jaundice may be due to any of three pathological conditions, two of which, phytogenous chronic copper poisoning and heliotrope poisoning are unrelated, while the third, hepatogenous chronic copper poisoning, results from a combination of the two former diseases. The incidence, conditions of occurrence, aetiology and methods of control of each of the diseases are given, but the difficulty of eradicating *Heliotropium europaeum* is pointed out.—C. H. GALLAGHER.

CULLIFORD, D. & HEWITT, H. B. (1957). **The influence of sex hormone status on the susceptibility of mice to chloroform-induced necrosis of the renal tubules.**—*J. Endocrin.* **14,** 381-393. [Authors' summary slightly modified.] **1556**

Adult male mice of two strains developed extensive necrosis of the renal tubules after exposure to low concentrations of chloroform vapour. Adult females showed no renal damage after exposure, but became fully susceptible after treatment with androgens. The susceptibility of males was greatly reduced by treatment

with oestrogens. Castration eliminated the susceptibility of the males in one strain but did not completely remove it in another. This residual susceptibility was abolished by adrenalectomy. Male mice under 11 days old did not develop necrosis even after massive doses of androgen. Between 11 and 30 days they were susceptible if given androgen. Thereafter they became spontaneously susceptible. Liver damage occurred in nearly all exposed mice and was not correlated with sex hormone status. Susceptibility could be induced in gonadectomized mice by methyl testosterone, testosterone propionate, dehydroepiandrosterone and progesterone, and by large doses of cortisone acetate . Preliminary exposure to carbon tetrachloride completely protected susceptible males against renal damage by chloroform.

TINDAL, J. S. (1956). **The effect of ergotamine and dihydroergotamine on lactation in the rat.**—*J. Endocrin.* **14,** 268-274. [Author's summary modified.] **1557**

Daily s/c injection of 0·2 mg. of ergotamine or dihydroergotamine to rats from the 12th to the 21st day of pregnancy caused high mortality in the young. This appeared to be due to a toxic effect *in utero* rather than an inhibition of lactation. Daily injection of 0·2 mg. of ergotamine to rats from the 2nd to the 13th day of lactation reduced the growth of the young and the food intake of the dams, but lactation was not affected by either drug. These findings appear to contradict previous reports [see *V.B.* **26,** 1398 & 2425], and are discussed in relation to them.

GAAFAR, S. M. & TURK, R. D. (1957). **The toxicity of malathion in chickens.**—*Amer. J. vet. Res.* **18,** 180-182. [Authors' summary modified.] **1558**

Experiments on malathion toxicity were performed on 297 fowls. Birds dusted with a powder containing 4% malathion, for 4 times at weekly intervals, did not develop signs of toxicity. Younger birds (3 weeks old) were apparently more tolerant than year-old birds to the effects of the parasiticide when given by mouth at a dosage of 200 mg./kg. body wt.

See also abstr. **1625-1626** (reports, Australia).

PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease).

SLATER, I. H., JONES, G. T. & YOUNG, W. K. (1956). **Mode of action of phenaglycodol, a new neurosedative agent.**—*Proc. Soc. exp. Biol., N.Y.* **93,** 528-531. [Authors' summary modified.] **1559**

Phenaglycodol, selected for trial because of its anticonvulsant and tranquillizing action, had a quietening effect on mice, cats and monkeys. Its effects on blood pressure, respiration and electrocardiogram were minimal.

Studies with selected reflex arcs revealed it to be a selective depressant of polysynaptic pathways at the spinal and supraspinal level.

After doses causing sedation but not sleep in cats, the electroencephalogram showed a pattern of 9–12 c/sec. synchronous activity at both surface and deep electrodes.

ARCHER, R. K. (1957). **Parenteral coagulants in the horse.**—*Vet. Rec.* **69,** 56-60. [Author's conclusions modified.]. **1560**

Oxalic and malonic acids 1% aa failed to reduce the clotting time of the blood of the normal horse at doses of up to 1·2 mg. per kg. (double the recommended dose). Haemocoagulase ("Reptilase"), a product made from the venom of certain snakes, also failed to reduce the clotting time of the blood of the horse at up to double the recommended dose.

LUND, E. (1956). **A comparison of the penicillins G and V on rabbits.**—*Acta path. microbiol. scand.* **39,** 421-430. [In English. Author's summary modified.] **1561**

In rabbits a higher concentration of penicillin in the blood is obtained after peroral administration of G than of V penicillin. In man the reverse is the case. A partial explanation must be that penicillin V combines with rabbit serum to a higher degree than with human serum. The faecal flora of normal rabbits is chiefly Gram-positive. After peroral treatment with large doses of penicillin, in particular penicillin V, a change to a preponderance of Gram-negative bacteria is observed, which in some animals results in diarrhoea. After termination of the treatment the faecal flora soon returns to normal.

MAZURCZAK, J. & TOMICKI, Z. (1956). Zachowanie się sulfonamidow przy elektroforetycznym rozdziale biaek surowicy krwi u psa.

[Electrophoretic examination of serum proteins in dogs following sulphonamide treatment.—*Méd. vét., Varsovie.* **12,** 726-728. [In Polish. English and Russian summaries.] **1562**

A 20% solution of sulphamethazine and sulphathiazole was given i/v to dogs in doses of 0·1–0·05 g./kg. body wt., and blood samples were collected 30 min. after the injection. Examination of the serum by electrophoresis after staining with β-naphthol revealed the presence of sulphonamides in front of the protein fraction. In the authors' opinion, *in vivo* the biologically active sulphonamides do not combine with any of the protein fractions.

—M. Gitter.

Groupé, V., Dougherty, R. M. & Manaker, R. A. (1956). **Comparative effects of hydrocortisone, a derived pyridopyrimidine, and xerosin on pneumonia produced in mice by viral and bacterial toxin.**—*J. Bact.* **72,** 604-609. [Authors' summary copied *verbatim.*] **1563**

Daily parenteral injections of hydrocortisone, a derived pyridopyrimidine (DPP), or the bacterial product, xerosin, suppressed pneumonia produced in mice by *Escherichia coli* endotoxin. However, only DPP and xerosin suppressed pneumonia induced by the toxicity of Newcastle disease virus (NDV) and delayed the onset of convulsions induced by influenza virus neurotoxin. It is not clear whether the failure of cortisone to affect NDV-induced pneumonia is associated with basic differences between such virus-induced lesions and other inflammatory responses or with the untoward effects of large amounts of hydrocortisone on the host.

Cuckler, A. C., Brown, H. D. & Siegel, H. (1956). **4,4'-Bisacetamidocarbanilide, a metabolite of nicarbazin.**—*Proc. Soc. exp. Biol., N.Y.* **93,** 248-251. **1564**

In calves large doses up to 1·0 g./kg. of nicarbazin (a molecular complex of 4, 4' dinitrocarbanilide and 2-hydroxy-4, 6-dimethyl pyrimidine) produced kidney damage and crystalline deposits in the renal tubules and slight to moderate bile duct proliferation and fibrosis in the liver. The material deposited in the renal tubules was identified as 4, 4'-bisacetamidocarbanilide. It is suggested that after absorption, nicarbazin splits into its components which are metabolized separately. The dinitrocarbanilide is first reduced to soluble diaminocarbanilide and then acetylated to insoluble 4, 4'-bisacetamidocarbanilide. The renal tissue reactions and the metabolic degradation of 4, 4'-dinitrocarbanilide resemble those known to occur with the sulphonamides.

—S. Brian Kendall.

Nissim, J. A. (1957). **Increased pituitary gonadotrophin activity after degeneration of seminiferous tubules produced by nitrofurazone.**—*Lancet.* **272,** 304-305. [Author's summary slightly modified.] **1565**

Nitrofurazone had an anti-androgenic effect on the seminal vesicles and prostate of mice when given in small doses. In larger doses it caused spermatogenic injury associated with interstitial-cell hyperplasia and enlargement of the seminal vesicles. This latter effect was absent in hypophysectomized mice treated similarly. Absence of a pituitary-inhibiting factor normally liberated by the germinal cells is put forward as the most plausible explanation of the secondary androgenic effect.

Underwood, G. E. & Weed, S. D. (1956). **Glyoxal and related compounds as potential blood sterilizing agents.**—*Proc. Soc. exp. Biol., N.Y.* **93,** 421-424. [Authors' summary modified.] **1566**

Glyoxal and β-ethoxy-α-ketobutyraldehyde (Kethoxal) were more viricidal than β-propiolactone. Glyoxal was the least lytic for human erythrocytes. None was significantly toxic for plasma proteins as measured by electrophoresis. The findings indicate that glyoxal is of potential value in the sterilization of human blood and plasma.

Brodey, R. S. & Martin, J. E. (1957). **Preliminary studies on some effects of a new thiobarbiturate in the dog.**—*Amer. J. vet. Res.* **18,** 158-161. [Authors' summary modified.] **1567**

The anaesthetic properties of methitural ("Thiogenal") were studied in dogs. Doses of 45 mg./kg. body wt. given i/v in 40 sec. produced light to moderate levels of surgical anaesthesia lasting about 20 min. Induction and recovery were smooth and rapid. Larger doses may produce undesirable degrees of respiratory depression and cyanosis. Three of 53 dogs died within 5 min. after inj. of the drug. Since fixed dosages and rates of inj. were employed, this may not represent the true mortality rate. The primary cause of death appeared to be respiratory paralysis. Profuse salivation and excessive

activity of voluntary muscles frequently occurred during surgical anaesthesia. The excessive salivation can be controlled with atropine. These undesirable features may limit the clinical usefulness of this thiobarbiturate. [See also *V.B.* **27**, 915.]

See also absts. **1324** (A.C.T.H. in bovine mammary induration); **1327-1329** (mastitis); **1335** (detergents and disinfectants in TB.); **1405** & **1407** (trypanosomiasis); **1410** (furazolidone in blackhead); **1413** & **1415** (coccidiosis); **1414** (furazolidone and nitrofurazone); **1418** (aminoacriquine in theileriasis); **1443** (chloramphenicol in porcine virus pneumonia); **1467-1468, 1473-1474** & **1476-1477** (insecticides); **1487, 1490, 1494-1497** & **1501** (anthelmintics); **1558** (toxicity of malathion).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

YEATES, N. T. M. (1956). **Heat tolerance in animals.**—*Aust. vet. J.* **32**, 242-245. **1568**

The reaction pattern of the majority of animals to exposure to heat contrasts with that of man, and tests show clearly enough the superior heat tolerance of man, who derives most benefit from sweating, whereas most domestic animals must rely largely on evaporative cooling from the respiratory tract. Other important factors in heat tolerance are large surface area, low basal metabolism, thick movable skin and smooth coat. In cattle special emphasis is placed on coat type and the necessity for selections to be carried out in winter, for animals which are smooth coated then should always be so.

The rabbit, cat, calf, dog, cow, Corriedale sheep and Merino sheep are placed in that order of increasing heat tolerance.—D. F. DOWLING.

DOWLING, D. F. (1956). **Opening of discussion.**—*Aust. vet. J.* **32**, 246-249. **1569**

Opening the discussion on the paper by Yeates [see preceding abst.], D. concluded that dissipation of heat is the critical characteristic of heat tolerance in cattle. The potential importance of heat loss due to the vaporization of skin moisture has eluded investigators who were not conscious of the importance of the nature of the coat of the animal, and not appreciative of the separation of physiological and physical factors concerned in the vaporization of skin moisture.

BELL, F. R. & EVANS, C. LOVATT. (1956). **Sweating and the innervation of sweat glands in the horse.**—*J. Physiol.* **133**, No. 3. p. 67*P* of Proceedings. **1570**

In 3 ponies under chloral hydrate anaesthesia the cervical sympathetic nerve on the left side was dissected out and divided near its junction with the vagus trunk. After 20 min. to one hour spontaneous sweating of the left side of the face began in 2 of the animals. Sweating was not brought about by electrical stimulation of the peripheral end of the divided sympathetic nerve. I/v injection of adrenaline (1–10 mg.) caused general sweating, but continuous stimulation of the sympathetic nerve before and after the injection prevented the appearance of sweat. It is concluded that the apocrine glands of the horse have no effective sympathetic secretory nerve supply. [See also *V.B.* **25**, 3003 and **26**, 3271].—M.G.G.

EVANS, C. LOVATT, SMITH, D. F. G., ROSS, K. A. & WEIL-MALHERBE, H. (1957). **Physiological factors in the condition of "dry coat" in horses.**—*Vet. Rec.* **69**, 1-9. **1571**

Studies of the physiology of sweating in normal horses in England made previously by two of the authors [Lovatt Evans & Smith, *vide V.B.* **25**, 3003] had shown that in horses sweating is adrenergic and that activity of the sweat glands is not controlled by the sympathetic nervous system. The normal mechanism by which sweat secretion is stimulated in the horse is an increase in adrenaline in the blood stream.

These findings have now been followed by studies using horses affected with anhidrosis ("dry sweating") in Malaya. These very interesting studies are described and illustrated in some detail and should be consulted in the original.

It was found that the adrenaline content of the blood of horses is higher in Malaya than in England. That "dry-sweating" horses are less sensitive to adrenaline than are horses which sweat normally. That "dry sweating" can be precipitated or aggravated by intravenous injection of adrenaline.

It was concluded that the "dry-sweating" condition of horses in the humid Tropics results from prolonged stimulation (or over stimulation?) of the sweat glands by adrenaline. The prolonged stimulation renders the sweat glands insensitive to adrenaline.

GROSVENOR, C. E. & TURNER, C. W. (1956). **Ergotamine, oxytocin and milk let-down in lactating rat.**—*Proc. Soc. exp. Biol., N.Y.* **93**, 466-468. [Authors' summary modified.] **1572**

The quantity of milk obtained by litters of lactating rats treated with ergotamine 10 min. before suckling was significantly less than that obtained by control litters from untreated dams. Oxytocin administered before or after ergo-

tamine restored normal milk let-down. Topical application of ergotamine to living rat mammary tissue resulted in constriction of the arterioles, but did not interfere with normal myoepithelial contraction induced by oxytocin. Results indicate that ergotamine does not inhibit milk let-down through vaso-constriction of mammary blood-vessels thus prohibiting access of oxytocin to effector myoepithelium. Rather, a competition between ergotamine and oxytocin for the the effector tissue or a neural block inhibiting the release of oxytocin by the posterior pituitary gland seems more probable.

FLUX, D. S. & MUNFORD, R. E. (1957). **The effect of adrenocorticotrophin on the mammary glands of intact mature female mice of the CHI strain.**—*J. Endocrin.* **14,** 343-347. [Authors' summary modified.] **1573**

Intact, mature, virgin female mice injected with A.C.T.H. daily for 3 weeks showed no change in total mammary gland area or in the degree of branching of the mammary duct systems. Ovaries and corpora lutea were larger than in control mice.

GIRI, K. V. & PILLAI, N. C. (1956). **Multiple haemoglobins in the blood of animals.**—*Nature, Lond.* **178,** 1057. **1574**

Agar electrophoresis of haemolysates of buffalo and rat blood revealed that buffalo blood contained two distinct haemoglobins and that rat blood contained two minor components of proteins in addition to the major component of Hb. The blood of the cow, sheep goat, horse, dog, rabbit and g. pig contained only one Hb under the conditions of electrophoresis used, namely pH 8·6 and 0·05 ionic strength of barbital buffer. [But see *V.B.* **26,** 1416].—M.G.G.

CHUBB, L. G. & LONG, P. L. (1957). **The estimation of prothrombin in chicken blood.**—*Brit. vet. J.* **113,** 3-7. [Authors' summary modified.] **1575**

An account was given of the preparation of thromboplastin from the brains of chicks and its activity in determining the prothrombin time of chick plasma. Russell viper-venom thromboplastin was also evaluated. Greater specificity was shown by the chick thromboplastin as judged by its activity on dilution and with diluted plasma. In all the determinations made, the range of error was two to ten times as great with Russell viper venom.

NILSSON, T. & ÅBERG, B. (1956). **Proteins and protein-bound carbohydrates in normal bovine serum.**—*Nord. VetMed.* **8,** 975-982. [In English, German and Swedish summaries. Authors' summary modified.] **1576**

The electrophoretically separated protein fractions in the blood serum of normal cows were studied. The total amount of protein-bound carbohydrates and the carbohydrate content of the different protein fractions were determined. The results were tabulated.

HOSODA, T., MOGI, K., KANEKO, T., ABE, T. & HIROE, K. (1955). **Effect of insulin on the serum vitellin level in the fowl.**—*Endocrinologia japon.* **2,** 137-142. [In English.] [Authors' summary modified.] **1577**

Administration of 25 I.U. of insulin twice daily for 2 days induced a decrease of serum vitellin in laying hens, probably because of decreased vitellin production in the liver.

WILKENS, H. (1956). Zur Topographie der Verdauungsorgane des Schafes unter besonderer Berücksichtigung von Funktionszuständen. [**The topography of the digestive organs of the sheep, with special reference to functional activity.**]—*Zbl. VetMed.* **3,** 803-816. [English, French and Spanish summaries. English summary slightly modified.] **1578**

With the help of 5 new illustrations of sheep fixed *in situ* the topography of the digestive organs is discussed in relation to their function. First, parts of the stomach are shown in their natural position and their relationships are discussed with reference to the radiological and physiological researches of Czepa & Stigler (1926). The author discusses in particular the interdependence of the organs and their relationship to the surrounding body wall, the diaphragm and the peritoneal fluid. The topography of the intestinal mass is then described in relation to the mesentery and the great omentum, the structure being related to the function of the different sections. Finally the topography of the liver is described. Changes in its position and shape with changing function and relations to the other abdominal organs will be dealt with in subsequent studies.

WILKENS, H. (1956). Zur Topographie der Verdauungsorgane der Ziege. [**Topography of the digestive organs of the goat.**]—*Dtsch. tierärztl. Wschr.* **63,** 434-441. **1579**

A comprehensive and well-illustrated description of the topography of the digestive organs and accessory glands of goats. Position and size of oesophagus, rumen, reticulum, omasum, abomasum, and the intestines are discussed separately, with frequent reference to comparative topography in cattle. In the

author's opinion the fact that no empty spaces exist between the various digestive organs in the peritoneal cavity is comparatively little known. Spaces found during surgical intervention are due to changes in internal pressure as a result of the operation.—F. K. Leeb.

Waites, G. M. H. (1957). **Recurrent cardio-accelerator fibres in the right cervical sympathetic nerve of the sheep.**—*J. Physiol.* **135,** 58-65. [Author's summary modified.] **1580**

Cardio-accelerator fibres were demonstrated in the lower course of the right cervical sympathetic nerve of sheep. These fibres are mostly pre-ganglionic to the right stellate ganglion but sometimes also contain a small post-ganglionic component. There is no evidence for such fibres being present in the upper half of the right or in any part of the left cervical sympathetic nerve. The cardio-accelerator fibres of the neck come from the thorax through the ansa subclavia and ascend in the right sympathetic nerve. They return to the thorax in the same nerve; their further course from the cervical sympathetic nerve to the heart is variable.

Jewell, P. A. (1956). **The vascular link between posterior and anterior lobes of the pituitary gland.**—*J. Endocrin.* **14,** No. 2. p. xxiv. of Proceedings. **1581**

A brief account of the demonstration in dogs of blood flow through short anastomoses between the capillaries of the anterior lobe and those of the posterior lobe.—R.M.

Saeki, Y., Himeno, K., Tanabe, Y. & Katsuragi, T. (1956). **Comparative gonadotrophic potency of anterior pituitaries from cocks, laying hens and non-laying hens in molt.**—*Endocrinologia japon.* **3,** 87-91. [In English.] [Abst. from authors' summary.] **1582**

Pituitaries from cocks were the richest in gonadotrophin and pituitaries from non-laying hens were more potent than those from laying hens.

Edgren, R. A. & Calhoun, D. W. (1956). **Density as an index of the effects of estrogens on bone.**—*Endocrinology.* **59,** 631-636. [Authors' summary modified.] **1583**

Oestrogenic substances stimulated increases in the densities of the femora of mice, presumably by causing proliferation of medullary bone. A constant daily dose of diethylstilboestrol, oestradiol or oestrone increased density in proportion to the period of administration. Oestrone appeared to be the most potent and diethylstilboestrol the least.

Purves, H. D. & Griesbach, W. E. (1957). **A study of the cytology of the adenohypophysis of the dog.**—*J. Endocrin.* **14,** 361-370. [Authors' summary copied *verbatim.*] **1584**

Five specific types of cell were recognized in the pars distalis of the dog's hypophysis after staining by Crossmon's modification of the Mallory stain, either alone or in combination with aldehydefuchsin. Orange acidophils are similar in appearance in mature and immature animals and are considered to secrete somatotrophin. Red acidophils are almost absent in immature animals and are strongly stimulated by oestrogen. They are considered to secrete lactogenic hormone. Blue basophils, present in both mature and immature animals, are sensitive to alterations in thyroxine supply and are considered to secrete thyrotrophin. Purple basophils are not fully developed in immature animals. Pale cells contain small numbers of basophilic granules composed of water soluble glycoprotein and are considered to be basophils of low granule content. They are, like the purple basophils, relatively undeveloped in the immature animal. Purple and pale basophils are considered to be gonadotrophic in function.

Bartlett, R. G., Jr. & Miller, M. A. (1956). **The adrenal cortex in restraint hypothermia and in adaptation to the stress of restraint.**—*J. Endocrin.* **14,** 181-187. **1585**

When rats were subjected to restraint in small wire cages and exposed to cold (0° to 1° C.) for 4 hours, the body temp. fell by 14° to 23°C. The body temp. of rats similarly exposed to cold but not restrained fell by only about 3°C. If they were adapted to restraint by being placed in the small cages for a week at room temp., the body temp. did not fall when they were exposed to cold.

Changes in the activity of the adrenal cortex, as measured by the amounts of ascorbic acid and cholesterol in the blood, were probably not of sufficient magnitude to account for either the increased thermostability after adaptation or the thermolability of animals exposed to the short-time stress. After adaptation to restrain, adrenalectomized rats did not maintain a normal body temp. when exposed to cold, unless they were given cortisone.—R.M.

Pennington, R. J. & Pfander, W. H. (1957). **The metabolism of short-chain fatty acids in the sheep. V. Some interrelationships in the metabolism of fatty acids and glucose by sheep-rumen epithelial tissue.**—*Biochem. J.*

65, 109-111. [Authors' summary copied *verbatim.*] **1586**

Butyrate lowered the uptake of propionate by sheep-rumen epithelium, and acetate lowered the uptake of butyrate. Ketone-body production from acetate was suppressed by propionate or glucose. Some acetate was produced when propionate and butyrate were metabolized together.

SCHAMBYE, P. (1956). Flytige, alifatiske syrer i drøvtyggernes stofomsaetning. **[Volatile fatty acids in ruminant digestion.]**—*Thesis, Copenhagen.* pp. 90. [English summary.] **1587**

A review of the subject as a whole and of the author's own experiments on volatile fatty acids in the portal and arterial blood of sheep. [See also *V.B.* **20,** 2118; **22,** 1489-90; **23,** 967; **26,** 1797 & 2090.]—R.M.

FRAIR, W. F. & WOODSIDE, G. L. (1956). **Effects of 8-azaguanine on early chick embryos grown *in vitro*.**—*Growth.* **20,** 9-18. [Authors' summary copied *verbatim.*] **1588**

Primitive streak to early somite stage chick embryos were grown on agar media containing 8-azaguanine. They differed significantly from controls by having fewer somites, by being shorter and by developing vesicles on both sides of the axis in the posterior region.

MERYMAN, H. T. (1956). **Mechanics of freezing in living cells and tissues.**—*Science.* **124,** 515-521. **1589**

A detailed discussion of the principles underlying crystallization and re-crystallization, slow and rapid freezing, thawing, and the response of different tissues to freezing.—T.E.G.R.

See also abst. **1629** (**book,** physiology of reproduction).

LIVESTOCK HYGIENE

WILLEMS, A.-E.-R. (1956). La stabulation libre en Belgique. Trois années d'expérience personnelle. **[Loose stabling of cows. Three years' experience in Belgium.]**—*Ann. Méd. vét.* **100,** 181-201. **1590**

There are about 100 of these establishments in Belgium. Compared with the traditional wintering quarters for dairy cattle, they are cheaper to build, labour-saving and hygienic. Three years' experience with one housing about 20 dairy cattle is described. The building, which faces south-east, consists of the food stores, sleeping quarters, feeding quarters, dairy, exercise yard, and separate quarters for the young animals and bulls. The temperature is only about 5°C. higher than that outside, but there are no draughts and humidity is low. The animals do not appear to be affected by cold. There has been no contagious or parasitic disease, nor does milk production decline during cold weather. All animals are dehorned. Self-feeding is practised. Faeces are not removed; fresh straw is put down occasionally and the animals derive warmth from the fermenting litter.—M.G.G.

GORDON, W. A. M. & LUKE, D. (1956). **Observations on restricted ventilation in pig houses.**—*Vet. Rec.* **68,** 1030-1031. [Authors' summary slightly modified.] **1591**

The effects of restricted ventilation on fattening pigs were studied on two large pig farms. The high relative and absolute humidity had no apparent harmful effects and over a period of two years sickness rates were very much reduced.

REPRODUCTION AND REPRODUCTIVE DISORDERS

SHERGIN, N. P. (1956). **[Role of fructose in artificial insemination.]**—*Proc. Lenin Acad. agric. Sci.* **21,** 35-39. [In R.] **1592**

Viability of bull and ram spermatozoa in a diluent composed of fructose, egg-yolk and citrate was better than in one composed of glucose, egg yolk and citrate. This was attributed to less lactic acid formation from the metabolism of fructose than from that of glucose.—R.M.

POLGE, C. & ROWSON, L. E. (1956). **The practical application of artificial insemination in pig breeding.**—*Vet. Rec.* **68,** 952-956. Discussion: pp. 957-962. **1593**

P. suggested that artificial insemination might be used in the eradication of virus pneumonia of pigs by the establishment of disease-free herds. The only reliable index of efficiency of insemination was the percentage of pigs which actually farrowed after their first insemination; over a period of 10 months this had been 30%. Latterly the addition of antibiotics to the semen appeared to have raised the rate and the final figures might therefore be appreciably better.

This effect might be linked with the major difficulty of determining the optimum time to inseminate.

In discussion on the paper it was reported that variations in technique appeared to be securing substantially better results in Norway, it was suggested that the low conception rates obtained might be due to an absence of the enhanced ovulation rate that might follow nervous reflexes which operate with natural service. (The farrowing rate was higher when "service" by a vasectomized boar preceded insemination).
—F. L. M. Dawson.

Self, H. L. (1956). **Swine reproduction.**—*Vet. Sci. News, Univ. Wis.* **10,** No. 1. pp. 7-13. **1594**

Ante- and post-natal losses among pigs are reviewed. Litter size depends on ovulation, fertilization of ova and viability of the fertilized ova. These physiological phenomena are influenced by sexual age of the dam, feeding and husbandry. The onset of oestrus after farrowing, the length of gestation, and early weaning of piglets, are discussed. It is considered that 3 weeks is the practical minimum weaning age.
—T.E.G.R.

Manton, V. J. A. (1956). **The fertility of bovine semen collected by electro-ejaculation.**—*Vet. Rec.* **68,** 1015. **1595**

3,712 inseminations using semen collected by electro-ejaculation gave a conception rate of 68%; 1,438 normal control inseminations with semen collected by artificial vagina from the same bulls, gave 64%. The differences were not statistically significant, but "interesting."
—F. L. M. Dawson.

Bertaud, S. & Probine, M. C. (1956). **Rate of heat production by bull spermatozoa.**—*Nature, Lond.* **178,** 933. **1596**

When unbuffered whole semen from a fertile bull was incubated at blood heat, there was a fall in heat production by the spermatozoa from 200 microwatts/ml. at one hour after incubation to 35 microwatts/ml. at three hours. These rough figures agreed reasonably well with calculations from the rate of fructolysis.
—F. L. M. Dawson.

Cons, D. N. (1957). **Some observations on the histology and histochemistry of the seminal vesicles of the bull.**—*J. Endocrin.* **14,** 304-308. [Author's summary slightly modified.] **1597**

The account of the cells of the seminal vesicles of the mature bull given by Mann *et al.* [see *V.B.* **20,** 788] was confirmed. Evidence is presented that cells of the inner layer of the alveolus undergo cyclic changes. These cells, at one stage of the cycle, contain much glycogen and are probably responsible for the secretion of fructose.

Fat, largely phospholipid, is mainly confined to the cells of the outer layer of the alveolus. Comparable cells in the calf and bullock contain no glycogen and virtually no fat, confirming that the secretion of these substances depends on the presence of androgenic hormone.

Casarett, G. W. & Hursh, J. B. (1956). **Effects of daily low doses of X-rays on spermatogenesis in dogs.**—*Radiation Res.* **5,** 473. **1598**

Dogs received total body X-irradiation 5 days a week at the rate of 3 r weekly. Spermatozoa counts declined progressively after 20–30 weeks of exposure, with increases in the percentage of abnormal, immotile, and dead spermatozoa, and fell to below 10% of normal within 40–60 weeks. Most of the animals became infertile within a year. No definite effects were observed in dogs receiving 0·3 or 0·6 r weekly, except perhaps for small increases in the incidence of abnormal spermatozoa.
—M.G.G.

Grunt, J. A., Knisely, W. H. & Berry, R. J. (1956). ***In vivo* observations on the seminal vesicles of intact, castrated and hormonally treated rats.**—*Endocrinology.* **59,** 540-547. **1599**

A microscopic field of living seminal vesicle was transilluminated and studied at 75 magnifications in 74 rats, which included intact and castrate controls and 12 of each given respectively testosterone and oestradiol. It was easier to identify the treatment applied to a given rat by examination *in vivo* than by examining stained sections. The degree of vascularity of the vesicles was decreased both by castration and oestrogen; increased by testosterone. Conversely, tissue transparency was respectively increased and decreased. Spontaneous rhythmic contraction occurred only in the absence of androgen.—F. L. M. Dawson.

Hawkins, D. F. & Labrum, A. H. (1956). **Function of the prostate.**—*Brit. med. J.* Nov. 24th. 1236. **1600**

Prostaglandin, an active smooth-muscle-contracting substance, is five times more concentrated in prostatic fluid than in the prostate gland itself. Recent results suggest that in man there is an association between semen prostaglandin concentration and fertility. The concen-

tration of this secretion appears to be directly related to the maintenance of spermatozoal activity.—F. L. M. Dawson.

Marx, D. & Haase, H. (1956). Möglichkeiten zur Erzielung eines artifiziellen Penisprolapses beim Bullen. **[Possible methods for obtaining artificial prolapse of the penis in bulls.]** —*Fortpflanzung.* **6,** 105-107. [English summary.] **1601**

Nine different methods are discussed, in addition to that developed by the authors, which involves blockage of the dorsal nerve of the penis at the lower segment of the sigmoid flexure, with 100 ml. 4% Isocain solution, using a needle 13 cm. long. Protrusion of the glans penis for at least 5 cm. follows in 10–12 min. A further advantage is that natural retraction soon follows treatment.—F. L. M. Dawson.

Lake, P. E. (1957). **The male reproductive tract of the fowl.**—*J. Anat., Lond.* **91,** 116-129. [Author's summary modified.] **1602**

The structure of the reproductive tract of the cock was examined to determine the nature of fluids which can enter collecting vessels during the massage method of semen collection. The organic matter appears to be mainly composed of complex lipid and protein-polysaccharide materials. It is derived from the seminiferous tubules and vasa efferentia. The apices of cells in parts of the vas deferens break down and appear in this way to contribute material to the seminal fluid. It was confirmed that the cock has no glands analogous to the seminal vesicles or prostate gland of mammals. Cytologically, the vascular bodies in the cloaca bear the closest resemblance to bulbo-urethral glands in respect of secreting abundant mucopolysaccharide. The lymph folds secrete mucin of a similar nature but which is probably less acidic in reaction.

Kosin, I. L. & Nagra, H. (1956). **Frequency of abortive parthenogenesis in domestic turkey.**—*Proc. Soc. exp. Biol., N.Y.* **93,** 605-608. [Abst. from authors' summary.] **1603**

The frequency of abortive parthenogenesis was as high as 80% in unincubated turkey eggs studied histo-cytologically. The incidence varied between strains, and appeared to be affected by differences in environment.

Pósalaky, Z. & Törő, I. (1957). **Fate of spermatozoa not participating in the fertilization process.**—*Nature, Lond.* **179,** 150-151. **1604**

Human and rat spermatozoa, introduced i/v into rats, were taken up by the organs of the reticulo-endothelial system (lungs, liver, spleen, kidneys). This suggests that cells of the phagocytic type are responsible for the disappearance of spermatozoa, and therefore the process is a function of the reticulo-endothelial system. The authors failed to confirm the recent conclusions of Genin *et al.* [source not given] that spermatozoa penetrate the uterine tissues and interact with them, the interaction revealing itself in the dissolution of the anterior part of the head of the spermatozoa. They suggested that these observations were due to an artefact arising during the preparation of sections for histological examination.—M.G.G.

Austin, C. R. (1957). **Fate of spermatozoa in the uterus of the mouse and rat.**—*J. Endocrin.* **14,** 335-342. [Author's summary modified.] **1605**

The uterine fluid of mice killed 2–6 hours after coitus and ovulation amounted to about 0·1 ml. and contained about 20 million spermatozoa and virtually no leucocytes. By 14–18 hours after coitus there were about 25 million leucocytes and the number of spermatozoa had fallen to about 11 million, most of which were undergoing phagocytosis. About 20 hours after coitus the uterine contents were apparently evacuated, in spite of the copulation plug. Phagocytosis of spermatozoa was also observed in rats but was much less extensive; this is considered to be because evacuation takes place sooner after ovulation, though still about 20 hours after coitus. The phagocytes were nearly all polymorphonuclear leucocytes. Leucocytic invasion of the uterine lumen seems to occur mainly because of distension of the uterus with fluid and not because spermatozoa are present. No evidence was obtained that either spermatozoa or leucocytes pass from the lumen into the uterine wall.

Sachs, L. & Danon, M. (1956). **Possibility of prenatal diagnosis of sex in cattle and sheep.**—*Nature, Lond.* **178,** 1402-1403. **1606**

The authors examined epithelial cells from young and old cattle and sheep and from 4 bovine foetuses 6–16 weeks old. Both male and female cells contained several chromocentres, and no clear sex difference was found. They concluded that a prenatal diagnosis of sex based on the determination of the percentage of amniotic fluid cells with a chromocentre at the nuclear membrane cannot be made in these animals. —M.G.G.

Moss, S., Sykes, J. F. & Wrenn, T. R. (1956). **Some observations on the bovine corpus luteum and endometrium during early stages**

of pregnancy.—*Amer. J. vet. Res.* **17,** 607-614. **1607**

The authors examined an average of 45 sections from each of 14 cows, 30–37 days pregnant, and one 66 days pregnant. Luteal cells of the corpus luteum of pregnancy differed from those of the c.l. of dioestrus in lacking alkaline phosphatase. The original endometrial lining appears to be destroyed, and replaced from trophoblastic cells, including the conspicuous binucleated giant cells.—F. L. M. Dawson.

Skjerven, O. (1956). **Endometrial biopsy studies in reproductively normal cattle. Clinical, histochemical and histological observations during the estrous cycle.**—*Acta endocr., Copenhagen.* Suppl. No. 26. pp. 101. **1608**

A full and illustrated account in English of the author's studies, the results of which have already been abstracted [*V.B.* **27,** 1288].—R.M.

Corti, L. (1956). Osservazioni sulle metrorragie nella specie bovina. **[Uterine haemorrhage in cows.]**—*Progr. vet., Torino.* **11,** 754 & 756-757. **1609**

As a rule uterine haemorrhage does not occur at any time during the oestrous cycle, though it may occasionally be caused by excessive hormonal stimulation. When this happens conception does not take place unless the spermatozoa have already reached the Fallopian tubes. The condition was observed in 13 cows, all of which failed to conceive. In a number of cases good results, it is claimed, were obtained by blood-letting after insemination.—T.E.G.R.

Bouckaert, J. H., Oyaert, W., Wijverkens, H. & van Meirhaeghe, E. (1956). Prolapsus vaginae bij het rund. **[Prolapse of the vagina in cows.]**—*Vlaam. diergeneesk. Tijdschr.* **25,** 119-132. [In Flemish. English French and German summaries.] **1610**

After the prolapse was corrected, the vagina was held in position by 2 sutures, one on each side of the body, introduced through the vaginal wall and through the sacro-iliac ligament to the skin of the croup region. This technique was first described by Mintschew (1953) in Bulgaria; its aim was to produce an inflammatory reaction, resulting in the vagina adhering to the wall of the pelvic cavity. There was no recurrence of prolapse in 25 out of 40 cows thus treated. An alternative procedure, amputation of the prolapsed portion of the vagina, succeeded in only 11 out of 29 cases.—R.M.

Gallina, L. (1956). La diagnosi di eventuale aborto nella vacca in gravidanza precoce. **[Abortion in the early stages of pregnancy in the cow.]**—*Gazz. Vet., Milano.* No. 3. pp. 4-8. **1611**

G. is concerned with proving to the owner that abortion (before 60 days) has taken place, and that a previous early diagnosis of pregnancy was correct. Such early abortions are ascribed to hormonal insufficiency, endometritis (in their turn attributed to poor husbandry), and lethal hereditary factors. The method adopted is that of forecasting from abnormality of the pregnancy. G. claims to distinguish the amniotic sac and the allantois in the course of rectal examination. Excess and deficiency of allantoic fluid are considered to prelude termination of the pregnancy; as is a gelatinous consistency of this fluid after the 40th day. Under-developed pregnancies are also recognized as abnormal. A catarrhal cervix is considered unpropitious, as is abnormal uterine tone or ovarian contents.

—F. L. M. Dawson.

Ingram, D. L. (1957). **Grafts of ovarian medullary tissue in the rabbit.**—*J. Endocrin.* **14,** 355-360. [Author's summary modified.] **1612**

It has been suggested that oocytes may develop from cells in the ovarian medulla. In order to test this hypothesis autografts of ovarian medulla were transplanted to various sites in 55 sexually mature rabbits. Tissue was recovered in only 18 instances, but even these grafts were reduced in size. No oocytes were seen. In a further 10 animals it was shown that grafts of cortical tissue persisted after medullary grafts had disappeared. It was concluded that medullary tissue cannot survive in the absence of the ovarian cortex. In 5 animals from which medullary tissue was recovered the uterus was less atrophic than in spayed controls. It is suggested that ovarian medullary tissue may secrete oestrogen, but that this capacity is soon lost in the absence of the follicular apparatus.

Aehnelt, E. & Grunert, E. (1956). Zur Fruchtbarkeit beim Rind nach Stilbenbehandlung in der Geburtshilfe. **[Fertility in cattle after treatment with stilboestrol during or after parturition.]**—*Fortpflanzung.* **6,** 107-111. [English summary.] **1613**

Of 111 cows which had been treated with synthetic oestrogens to assist delivery by opening the cervix, or to loosen a retained placenta 72% conceived again as compared with 67% of 100 controls. No disturbances in reproductive physiology could be observed up to 5 months after calving.—F. L. M. Dawson.

ROBINSON, T. J., MOORE, N. W. & BINET, F. E. (1956). **The effect of the duration of progesterone pre-treatment on the response of the spayed ewe to oestrogen.**—*J. Endocrin.* **14,** 1-7. [Abst. from authors' summary.] **1614**

Four trials were conducted, each with 72 ovariectomized ewes. There was a progressive increase in sensitivity to oestradiol benzoate, as measured by oestrous behaviour, with increasing duration of progesterone pre-treatment at daily dosages of 3–24 mg. The amount of oestradiol required to cause oestrus in 50% of ewes, when injected after 3, 6 and 12 days' treatment with progesterone, averaged 18·7, 15·7 and 13·1 μg., respectively. The amounts causing oestrus in 90% of ewes under the same conditions averaged 27, 22·6 and 19 μg., respectively.

MOORE, N. W. & ROBINSON, T. J. (1957). **The vaginal response of the spayed ewe to repeated injections of oestradiol benzoate given alone or preceded by progesterone.**—*J. Endocrin.* **14,** 297-303. [Authors' summary modified.] **1615**

Seventy-two spayed Suffolk cross-bred ewes were used in a series of 6 trials, conducted at intervals of 16 days.

The vaginal response to oestradiol benzoate when preceded by 12 days' treatment with 10 mg. daily of progesterone did not differ significantly from trial to trial. The vaginal response to oestradiol given alone showed a highly significant decline, with successive treatments, from a hypersensitive to a hyposensitive condition, clearly suggesting the development of a refractory state. It appears, therefore, that in addition to its role in maintaining a constant and highly sensitive state of psychic reactivity to oestrogen, progesterone is involved in the maintenance of a uniform vaginal sensitivity to this hormone.

COXON, R. V., KORENCHEVSKY, V. & LAWRENCE, A. (1956). **Chemical changes in the heart, liver and kidneys of rats after administration of sex hormones.**—*J. Path. Bact.* **72,** 613-621. [Authors' summary modified.] **1616**

Analysis of the liver, heart and kidneys of intact and castrated rats treated with testosterone propionate revealed a normal nitrogen and water content. This in association with changes in weight and cell size indicates hypertrophy in these organs and their cells in response to androgenic hormone. This is consistent with other reports on changes in functional capacity. Oestrogen treatment produced no detectable change in the nitrogen content of the 3 organs but an increase in the water content of the liver was observed. The gain in weight of the liver is therefore ascribed in part to the accumulation of water together with cellular hypertrophy and the possible deposition of glycogen. No evidence has been found in these or in previous experiments for a cardiotrophic effect attributable to oestradiol.

PINCUS, G., CHANG, M. C., HAFEZ, E. S. E., ZARROW, M. X. & MERRILL, A. (1956). **Effects of certain 19-nor steroids on reproductive processes in animals.**—*Science.* **124,** 890-891. **1617**

Of many compounds tested on rats, rabbits and mice, four were pre-eminent and particularly 17 α ethinyl 5 (10) estraenolone, which was 400 times as active as progesterone uterotrophically; and to some extent in ovulation inhibition, but "corpus luteum replacement during pregnancy" was very poor. There was a slight suggestion from clinical trial on 50 patients that some forms of human sterility were relieved by these "progestins."

—F. L. M. DAWSON.

ATHERDEN, L. M. & GRANT, J. K. (1957). **The metabolism of progesterone in the rat**—*J. Endocrin.* **14,** 371-375. [Abst. from authors' summary.] **1618**

Progesterone was administered i/p to adult male rats. Neither pregnanediol nor allopregnanediol was detected in the pooled urine.

SHATALOV, P. I. (1956). **[Problems of the eradication of bovine sterility.]**—*Veterinariya, Moscow.* **33,** No. 11: pp. 48-51. [In Russian.] **1619**

Over a thousand cows in the Smolensk and Stalingrad regions were examined for 2 years. The main cause of sterility was food of poor quality. Mineral deficiency was diagnosed by radiography, by the rarefied appearance of the bone of the horn core. Massage of the ovaries and uterus was recommended for the treatment of sterility of unknown cause.—R.M.

MOORE, K. L., GRAHAM, M. A. & BARR, M. L. (1955). **Sex chromatin in the freemartin.**—*Anat. Rec.* **121,** 442. **1620**

Nerve cell nuclei from a normal female calf and 2 freemartins had a typical female structure, characterized by a well developed mass of sex chromatin, while in nerve cell nuclei from 3 male calves sex chromatin was inconspicuous or absent. In cells other than neurones the nuclei contained numerous clumps of chromatin, and sex could not be diagnosed.—M.G.G.

GOLDZVEIG, S. A. & SMITH, A. U. (1956). **The fertility of male rats after moderate and after severe hypothermia.**—*J. Endocrin.* **14,** 40-53. [Authors' summary slightly modified.] **1621**

Male rats which had been exposed to a combination of hypoxia, hypercapnia and cold, and in which body temp. had fallen to 15°–20°C., had reduced sex drive and fertility during the subsequent 1–2 weeks. If further cooled until respiration and circulation had been arrested for an hour, and until the body temp. was 0°–1·5°C., they had reduced sex drive and fertility for 8 weeks after reanimation. Developing spermatozoa and spermatids were damaged by hypothermia, but not the spermatogonia and spermatocytes in the majority of seminifreous tubules. During the first week after cooling a high proportion of the epididymal spermatozoa were found to be decapitated; their acrosomes were distorted and their midpieces and tail sheaths disrupted.

CALISTI, V. (1956). Fattori ereditari e congeniti dell'infertilità maschile. **[Hereditary and congenital causes of sterility in the male.]**—*Vet. ital.* **7,** 1181-1205. **1622**

An uncritical review of the world literature on this subject, with 146 references. Much space is devoted to consideration of the work of Lagerlöf and Eriksson, with emphasis on inherited poor breeding tendencies which are common to both sexes. A working classification of the relevant types of defect is presented.

—F. L. M. DAWSON.

SCHLOTTHAUER, C. F. & ZOLLMAN, P. E. (1956). **The occurrence of so-called "white heifer disease" in a white Shetland pony mare.**—*J. Amer. vet. med. Ass.* **129,** 309-310. **1623**

The following P.M. findings were made in a 2-year-old pony with this disease; the cervix was absent, the uterus was atrophic and had no outlet into the vagina, the right uterine horn was 14 cm. long and 4–6 cm. in diameter and contained clear fluid, the left horn was 5 cm. long and 0·3 cm. in diameter. The bladder was absent, the ureter of the right kidney entered the anterolateral portion of the vagina, the left kidney was atrophic and lacked a ureter.

—M.G.G.

IRWIN, M. R. (1956). **Blood grouping and its utilization in animal breeding.**—*Proc. VIIth Int. Congr. Zootech.*, Madrid Part 2. pp. 7-41. [In English. French, German and Spanish summaries.] **1624**

A valuable review, with special reference to work done at the University of Wisconsin.

—R.M.

See also absts. **1356** (E. coli as a cause of sterility in dogs); **1358** (investigations on defense-mechanism of oestrous and pseudopregnant rabbit uteri); **1369-1378** (brucellosis); **1390-1394** (V. fetus infection); **1409** (trichomoniasis); **1414** (effect of furazolidone and nitrofurazone on fowls); **1625** (report, Australia); **1629** (book, physiology of reproduction).

REPORTS

AUSTRALIA. (1955). **Seventh annual report of the Commonwealth Scientific and Industrial Research Organization for the year ending 30th June, 1955.** pp. 185. Canberra: A. J. Arthur, Commonwealth Govt. Printer. 11s. **1625**

Studies on MASTITIS confirmed reports that a closed herd will remain free after *Str. agalactiae* has been eliminated. This is not so with staphylococcal infections which treatment with antibiotics usually failed to remove from infected udders. Work on calfhood vaccination with *Br. abortus* Strain 19 was continued. When some animals, presumably of high susceptibility, were eliminated from further tests because they became infected at the first challenge, most of the remaining animals were resistant to infection for six years after calfhood vaccination. In some control cattle, proved to be infected at calving, virulent *Br. abortus* was isolated from the milk for up to two months before the next calving, in the absence of strong evidence from agglutination tests that infection was present. *Nocardia dermatonomus*, the causal organism of MYCOTIC DERMATITIS of sheep, is sensitive to penicillin, aureomycin and chloramphenicol, moderately sensitive to streptomycin and sulphadimidine, but resistant to actidione. Severely affected sheep improved after i/m injections of 1 g. chloramphenicol or 600,000 units of procaine penicillin, but relapsed after heavy rain. Neither 3% chloramphenicol nor 3% aureomycin eye ointments nor 1% chloramphenicol in glycerol gave spectacular results in CONTAGIOUS OPHTHALMIA in sheep. Attempts to cultivate *Fusiformis nodosus* by scarification of the feet of rabbits and g. pigs, and inoculation into the anterior chamber of the eye of rabbits and sheep failed. Growth in cooked-meat medium or on solid media was greatly enhanced by the addition of horn clippings (or of charcoal). Calves vaccinated when 7 days old against BOVINE CONTAGIOUS PLEUROPNEUMONIA developed an effective immunity, but the occurrence of joint lesions and valvular lesions in the heart suggest that it is inadvisable to vaccinate

calves younger than 2 or 3 months old. The vaccine does not deteriorate on storage at 4°C., but at 25° and 37°C. deterioration is rapid and severe.

Work on MYXOMATOSIS included preservation of virulence by alternate maintenance in mosquitoes and rabbits. The French strain was introduced but did not compete successfully with the local strain.

The egg-laying patterns of *Damalinia ovis* and *D. equi* are similar. With *D. equi* the diameter of the hairs is the most important ecological factor. The lice will attach the eggs only to the fine fibres in the horse's coat and when these hairs are shed in the spring about 70% of the louse population may be lost. Trials confirmed that dieldrin and aldrin are more effective than B.H.C. in preventing BLOWFLY STRIKE. Dieldrin and aldrin may be leached from the fleece by heavy rain faster than B.H.C. S/c injections of dieldrin, aldrin or lindane did not show promise in preventing strike. Both "Borocit" (containing boric acid and oil of citronella) and dieldrin (0·1%) gave good results in preventing strike after lamb-marking. Zebu-cross cattle were more resistant to *Boophilus microplus* than Shorthorns. A toxic haemoprotein was isolated from the eggs of the tick. Depletion of B.H.C. in cattle dips was more rapid at high temperatures and in the presence of faeces. A lowering of pH reduced breakdown. A colloidal formulation of D.D.T. was more effective than a wettable powder. Slight resistance to D.D.T. has been detected. Toxaphene showed promise in killing ticks, but resistant ticks have appeared. Dieldrin gave longer protection than D.D.T. Both malathion and diazinon were promising, and are of special interest because of the general development of resistance to chlorinated insecticides. Chlorthion was less effective than other organic phosphorus insecticides. S/c inj. of lindane, aldrin and dieldrin showed promise; D.D.T. was ineffective. When pastures in the Tropics were destocked for 3 months in summer or 5 months in winter residual larval tick populations were slight and fewer dippings were required to control infestation. In southern Queensland spring and early summer dipping reduced the need for subsequent dipping provided there were no introductions of heavily infested cattle during the summer. S/c inj. of dieldrin or B.H.C. did not affect *Psorergates ovis* on sheep.

In trials with copper pentachlorphenate as a molluscicide, spraying was more effective than dusting. When the snail population was reduced considerably by treatment in winter it tended to remain low until the end of the following summer, *i.e.*, when climatic conditions are most favourable for *Fasciola hepatica*. Pure phenothiazine may be slightly more effective than "commercial" preparations against *Trichostrongylus* spp. in sheep. Sheep dosed with either 10 g. weekly or 5 g. twice weekly for 9 weeks continued to pass a few viable eggs of *Trichostrongylus* spp. Eggs of *Haemonchus contortus* and *Oesophagostomum columbianum* disappeared after the first week. Piperazine salts were highly effective against oxyurids in mice and *Oes. columbianum* in sheep, but not against *H. contortus* or *Trichostrongylus* spp. A complex of piperazine and carbon bisulphide was effective against *Oes. columbianum* even when dosed into the rumen, but not against *H. contortus* unless dosed into the abomsum. It was not effective against *Trichostrongylus* spp. Hexachlorethane dissolved in liquid paraffin or tetrachlorethylene is effective against *H. contortus* and *F. hepatica* in doses much lower than those for powder preparations. Nicotine sulphate was effective against *T. axei* when given after swabbing the mouth with copper sulphate; it was not effective against *Moniezia* spp. either by ruminal or abomasal injection. Solns. of sodium arsenite were effective against *Moniezia* spp. only when injected into or swallowed into, the abomasum. A mixture of copper sulphate, nicotine sulphate and 1:8 dihydroxyanthraquinone reduced infestations with *H. contortus*, *Oes. columbianum* and *Trichostrongylus* spp. in sheep in the field. 1:8 Dihydroxyanthraquinone was used to control *Chabertia ovina* selectively leaving *Trichostrongylus* spp. unaffected. In studies on the route of fluids administered through a short oesophageal tube the excretion rate of dyes may be used to ascertain the destination of the drench. Phenothiazine proved useful: when swallowed into the abomasum it appeared in the urine within about 30 min., but when swallowed into the rumen it took at least 2 hours. Swabbing the mouth with $CuSO_4$ soln. ensured that fluids were swallowed into the abomasum in a high proportion of sheep. Phenothiazine was equally effective against *Syphacia* and *Aspicularis* in mice. Piperazine diacetate was effective against these nematodes; p-hydroxyphenothiazine, 1:4 thiazine acetate and N-methyl piperazine dihydrochloride showed some activity; but the acetyl ester of p-hydroxyphenothiazine, o-ethoxyphenothiazine, m-chlorophenothiazine, m-methoxyphenothiazine n-n-dimethyl piperazine diacetate, monocarboxypiperazine tartrate, basic tetrahydroquinozaline and thiazine acetate were ineffective. Doses of

20 g. phenothiazine were fatal in lambs 7 to 19 days old, with deaths spread over two weeks. The incidence and severity of PHOTOSENSITIZATION in young lambs increased after drenching with 10 or 20 g. phenothiazine. When the nutritive level of sown pastures was reduced by a high rate of stocking, worm burdens were not increased. There were 0·5 million larvae per acre in sown against 4·5 million in native pastures and the lighter infestations may have been due to reduced exposure. There was no difference in worm burdens when groups of sheep on the two kinds of pasture were given similar doses of larvae. An initial infestation of *T. colubriformis* given to lambs at 4 weeks of age did not induce resistance, but when it was given at 8 weeks of age the lambs were resistant when challenged later. Up to 12 weeks may elapse after a challenge dose of larvae before egg counts rise; this confirms that suppression of egg laying is one manifestation of immunity. Sheep killed during this period may harbour a heavy infestation with non-egg-laying worms. The titre of circulating antibodies is usually high during this period. The influence of antibodies in colostrum in preventing infestations is being studied. Lambs reared worm free in pens failed to acquire infestations with *Oes. columbianum* when placed on pastures while still unweaned. Exsheathment of infective larvae of nematodes of sheep occurs in the alimentary canal immediately anterior to the region in which the adults live. *H. contortus, T. axei* and *Ostertagia* spp. exsheath in the rumen. *T. colubriformis* and *Nematodirus* spp. in the abomasum and *Oes. columbianum* in the small intestine. Larvae of *Strongyloides* spp. readily infect sheep through the skin, but oral administration is unreliable. Ruminal fluid is lethal to them. The wall of the small intestine of rats infested with *Nippostrongylus muris* contained 2–3 times more water than that of uninfested rats. Circulating antibodies against nematode parasites were detected in the serum of new-born calves and persisted for a month. They may not be found again until the animal is 4 to 6 months old or more. There was a close relationship between the titre of antibodies and resistance to *H. placei*. Most calves exposed to natural infestations with *H. placei* develop resistance and throw off their infestation, while others become resistant only after clinical haemonchosis. About 10% fail to become resistant or lose resistance and die. Most clinical cases were seen in winter and early spring when infective larvae were abundant and the nutritive value of pastures was low. Experimental infestations with *H. placei* did not persist longer than 6–8 weeks and the calves were then resistant. In sheep the worms live much longer and the development of resistance is erratic. In resistant calves many immature worms were found and they may be important in the epidemiology of the disease. There was some evidence that repeated treatment with phenothiazine delayed the development of resistance. In experimentally infested calves haemoglobin values declined within 2 weeks and reached minimum values of 40 to 50% of initial values 5 to 7 weeks after infestation. Values were still subnormal 14 weeks after egg counts had fallen. Haematocrit and r.b.c. counts corresponded with Hb values. Total serum protein remained constant. In infested calves on a lucerne-chaff ration blood calcium and phosphorus remained normal, but on an oat chaff ration phosphorus declined. Neither phenothiazine nor tetrachlorethylene, given after a dose of sodium bicarbonate to close the oesophageal groove, was effective against *Bunostomum phlebotomum* or *Cooperia* spp., but both were effective against *H. placei*. *H. placei* larvae reached the infective stage in 10–14 days during spring. Migration from the dung pat then began and after 1–2 weeks up to 60% of the larvae were in the herbage. Lateral migration of at least 12 inches was recorded. There was considerable mortality after 2 months, but a few larvae were recovered up to 150 days later. *Cooperia* spp. larvae appeared to accumulate during the winter months. When *H. placei* larvae were kept at 26°C., fat disappeared in 14 days, but little change occurred in larvae at 9°C. The relation between fat content and infectivity is being studied in *Nematospiroides dubius* larvae. Only total length was a constant difference between microfilariae of *Onchocerca gibsoni* and *O. gutturosa* of cattle. Examination of the chromosomes and studies on hybrids indicated that *H. contortus* of sheep and *H. placei* of cattle are distinct species.

In PHALARIS STAGGERS neither cobalt nor vitamin B_{12} afforded protection if administered parenterally. The protective action of cobalt is associated with the very considerable change which occurs in the mixed population of micro-organisms in the rumen when the Co concentration in the ingesta is increased from an incipiently deficient level. As a preventive measure top-dressing with Co is expensive and the effects are not prolonged.

Saponified extracts of chloroplast material from subterranean clover contained a phenolic oestrogen distinct from genistein.

Work on BOVINE CHRONIC HAEMATURIA is

now based on the hypothesis that it may be due to irritant substances related to known carcinogens. Lucerne hay appears to be a causal factor in SHEATH ROT (BALANITIS) in sheep. The mechanism of the severe haemoconcentration seen in sheep which eat excessive amounts of wheat is being studied. Rapid generation of large amounts of lactic acid in the rumen gives rise to a greatly hypertonic fluid. Osmotic hypohydraemia follows and in the early stages r.b.c. from the spleen appear in the circulation and maintain a normal blood volume. Further haemoconcentration is probably due to a continued fall in plasma volume and hence blood volume. A toxic factor, isolated from the rumen fluid of wheat-gorged sheep, produced haemoconcentration on injection. Attempts to use dicyandiamide in place of urea as a source of nitrogen for sheep were unsuccessful.

In experimental poisoning of rats with the alkaloids from *Heliotropium europaeum* the characteristic change was progressive enlargement of the liver cells, which appeared to lose their capacity to divide. The death rate of the cells is increased and the liver becomes atrophic.

Sheep drank water containing 1·5% sodium chloride for 10 months without harmful effects. Sheep confined to water containing 20 p.p.m. of fluorine for 3 years showed mottling and selective abrasion of the molars which progressed sufficiently to cause unthriftiness.

Although contradictory keto-acid analyses are obtained from the blood of sheep with PREGNANCY TOXAEMIA, evidence is accumulating that in sheep with this disease, and in fasted sheep, there may be interference with the oxidation of C_2 compounds *via* the tricarboxylic acid cycle. In experimental VITAMIN A DEFICIENCY in sheep a single massive dose of vitamin A satisfies their requirements for about 6 months. In studies on COBALT DEFICIENCY, withdrawal of a Co supplement from sheep on a deficient diet led to changes in the flora in the rumen, and within 4 days vitamin B_{12} production fell to less than a tenth of that when the diet contained adequate Co. Seasonal changes in pastures may lead to considerable changes in vitamin B_{12} production in the rumen and on many pastures sheep may be in a negative vitamin B_{12} balance for part of the year and thus depend upon the stores of the vitamin accumulated during more favourable periods. Further studies on copper metabolism showed that relatively large amounts of molybdenum administered to sheep on Cu deficient pastures limited Cu storage in the liver in those dosed with Cu, but increased Cu retention in those not given a Cu supplement; in each case the blood Cu was increased. Administration of sulphate (3·2 g. SO_4 daily) for a year had no significant effect on liver storage of Cu but during this period the marked rise in the Cu content of the blood induced by Mo disappeared in those that were supplemented with 10 mg. Cu daily. Studies in relation to chronic COPPER POISONING confirmed that as the SO_4 intake is raised, Mo becomes more effective in restricting accumulation of Cu in the liver in sheep on a high Cu intake, but that increase of SO_4 intake above an optimum level had no greater effect; that for any given SO_4 intake restrictions of Cu accumulation in the liver and in the body as a whole increases with the Mo intake until a maximal effect is obtained. Further intake of Mo then has no greater effect on limiting Cu storage. Similar relationships between Mo and SO_4 intake and the rate of loss of stored Cu in sheep on low Cu intakes have also been demonstrated. However, when the Mo and SO_4 intakes are raised to very high levels (100mg. and 10 g. daily, respectively) loss of stored Cu ceases. These conditions are accompanied by a rise in blood Cu and an inhibition of Cu utilization with the immediate appearance of some of the signs of Cu deficiency. A slight fall in liver Cu occurred in sheep after fresh growth of pastures began in the autumn. Other nutritional studies with sheep included vitamin B_{12} and haemopoiesis, microbiological processes of rumination, diabetic sheep and lambs, toxicity of fluoroacetate, utilization of glucose by intestinal mucosa, and drought feeding including special studies on utilization of low-quality roughage.

Studies on INFERTILITY in sheep included the breeding season in relation to light, seasonal variations in fertility, failure of conception and embryonic mortality, pregnancy diagnosis, effects of high temperatures on pregnancy, physiology of foetal and neonatal lambs, effects of fasting in new-born lambs, effects of malnutrition during terminal stages of pregnancy, seasonal variations in lactation, neonatal mortality in lambs (including observations on the possible relation of copper deficiency to deposition of haemosiderin in the liver of lambs). Breeding studies were continued in relation to inheritance of fleece characters, twinning and incidence of FLEECE ROT between strains of Merino sheep.

The influence of the anterior pituitary and the thyroid on wool growth and experimental histology of skin and hair were included in studies on sheep biology.

Investigations with cattle included supple-

mentary feeding, crossbreeding, environmental control of coat changes, heat regulation, adaptation to tropical environment and studies on the sweat glands.—H. McL. GORDON.

SOUTH AUSTRALIA. (1955). **Sixteenth Annual Report of the Council of the Institute of Medical and Veterinary Science, July 1953-June 1954.** pp. 107. [Division for Veterinary Research. pp. 47-67.] **1626**

A survey of the incidence of MASTITIS in cows dispelled the belief that mastitis due to *Str. agalactiae* has become negligible since the introduction of penicillin. Of milk samples from 6,185 cows 16% were infected with *Str. agalactiae*. There was a much lower incidence of *Str. agalactiae* in regions where veterinarians had been engaged in mastitis control. Examination of 112 lymph nodes from pigs for *Mycobacterium tuberculosis* revealed the organism in cultured material in 58, while acid-fast organisms were detected in 63 smears and suspected in 2. Most of the lesions were due to the avian strain. Histological and cultural examination of 355 lymph nodes from the ileo-caecal region of aged cows did not reveal *Mycobacterium johnei*. A satisfactory complement-fixation test was developed for the detection of infection in sheep due to a "brucella-like" organism. In a survey it was found that all of 125 rams from flocks where there was no clinical evidence of epididymitis gave negative results to the test. However, in the clinically affected cases there was a large discrepancy between clinical and serological tests. It appeared that extensive infections with *Corynebacterium ovis* masked the presence of *Brucella*. There appeared to be a low infection rate in ewes even in flocks where rams showed a high rate. A survey of losses in young chickens showed that half of the deaths were due to OMPHALITIS, with unabsorbed yolk-sacs accounting for over 30% of cases. PNEUMONIA, PULLORUM DISEASE and urate deposits accounted for the remainder. Urate deposits were thought to be due to deficiency of vitamin A.

Pasteurization of eggs showed promise as a means of preservation during storage and transport.

Epidemiological investigations on HELMINTH INFESTATIONS in sheep were continued. Lambs dosed monthly with phenothiazine were only 4 to 5 lb. heavier than controls at 13 months old, but it was found that only 75% of the particles of the phenothiazine preparation were less than 30 μ in diameter. 10% of the lambs were affected by their worm burden and improved after the first, but not subsequent, doses of phenothiazine. If not treated these lambs gradually lost condition. The seasonal pattern of change in worm burdens showed a peak in spring and a decline to very low levels which were not altered by rainfall in the subsequent autumn. An isolated observation showed higher egg counts in lambs grazing lucerne than in lambs on natural pastures. A survey of the seasonal incidence of *Fasciola hepatica* showed maximum intake of cercariae in February-March (late summer-early autumn). Liver damage from *Cysticercus tenuicollis* began in December and was maximal in March-April.

The paralysis tick (*Ixodes holocyclus*) was recorded from a kangaroo showing incoordination; this confirmed a previous report from the same locality—the only one in South Australia.

Studies on the toxicity of *Oxalis cernua* showed that OXALIC ACID POISONING depends on the nutritional status of the sheep. Where the nutritional level is low and sheep might be expected to die from oxalic acid poisoning death can be prevented by calcium supplements. The way in which calcium protects has not been determined, but it does not appear to be a simple formation of insoluble calcium oxalate. A pink coloration of the eggs and faeces of a hen was due to the plant dye pelargonidin, derived from either malvidin or hirsutidin in *Spergularia rubra* or *Malva parviflora*.

Medical research problems of veterinary interest included mosquito-borne ENCEPHALITIS, Coxsackie viruses, PSITTACOSIS, "Q" FEVER (an outbreak in abattoir workers handling sheep offal which included material from pregnant ewes).

Among the "interesting cases" listed are acute COCCIDIOSIS in sheep, double OTITIS in a duck, *Vibrio fetus* infection in cattle, TRICHOMONIASIS in birds, post-vaccination deaths and illness in fowls (the various causes are listed), PULLORUM DISEASE in fowls and EPITHELIOMA of the nose in sheep.—H. McL. GORDON.

BOOK REVIEWS

GREENSTEIN, J. P. & HADDOW, A. [Edited by.] (1956). **Advances in cancer research. Volume IV.** pp. ix+416. London (& New York): Academic Books Ltd. $10.00. **1627**

This further volume in an invaluable series gives authoritative reviews of progress in various fields of cancer research. The three chapters that are likely to be of most interest to the veterinary reader are as follows.— Farber *et al.*, "Advances in chemotherapy in man" (dealing chiefly with cytotoxic agents—*e.g.* nitrogen mustard — and antimetabolites); Galton, "The use of myleran and similar agents in chronic leucaemia"; and Mühlbock, "The hormonal genesis of mammary cancer". Mühlbock is chiefly concerned with the hormonal basis of mammary cancer in mice, but he makes a theoretical comparative analysis of the ocurrence of mammary cancer in woman and in mice, and puts forward a theory of the origin of human breast cancer, relating it to the hormonal stimulation of the breast with each menstrual cycle, that could be extended to explain the common occurrence of mammary tumours in bitch. Other chapters deal with biological, pharmacological and chemical aspects of cancer research, and one that might be mentioned is on "Lipids in cancer", by Haven & Bloor; many aspects of lipids in relation to cancer are discussed, *e.g.* their role in carcinogenesis, and the lipid content and metabolism of tumours and of tumour-bearing animals.—E. COTCHIN.

NEWELL, F. W. [Edited by.] (1956). **Glaucoma. Transactions of the first conference, December 5, 6, and 7, 1955, Princeton, N. J. [Sponsored by the Josiah Macy, Jr. Foundation.]** pp. 251. New York: Josiah Macy, Jr. Foundation. $4.50. **1628**

The objects of the Josiah Macy, Jr. Foundation in organizing conference groups are now well known. This book is a *verbatim* report of the informal discussion which took place at the first three-day conference on glaucoma in December , 1955. The subject chosen for discussion on this occasion was narrow angle or iris-block glaucoma. After a general review of the condition had been given, the central control of intraocular pressure and the physiological and pharmacological factors influencing the resistance to the outflow from the aqueous humour were discussed. It was agreed that a relative pupillary block is the primary basic mechanism involved.—J. A. NICHOLSON.

PARKES, A. S. (1956). [Edited by.] **Marshall's physiology of reproduction. Volume I: Part I.** pp. xix+688. London (New York & Toronto): Longmans, Green & Co. 3rd Edit. 150s. **1629**

The third edition of this work will ultimately comprise three books. One of these, Volume II was published in 1952 and dealt with events after fertilization. Volume I is to appear in two parts of which the present publication is the first: it is concerned chiefly with structural changes in the non-pregnant female. Five authorities have written, either jointly or individually, six long chapters entitled (1) the breeding season, (2) Morphology of the reproductive tract, (3) Cyclical changes in reproductive organs of lower vertebrates, (4) Oestrus cycle in mammalia, (5) Ovarian changes, and (6) Changes in accessory reproductive organs.

Although the preface states that absolute biological completeness was no longer an aim, each chapter is a most exhaustive review of literature up to 1952. Work later than 1953 is not included. This vast accumulation of factual matter would swamp the reader were it not for the meticulously systematic presentation which makes for easy orientation and facilitates rapid reference. In general the available information concerning each animal class is presented separately, beginning with the lowest and progressing to the primates, so that the evolutionary nature of reproduction is made manifest. Such an arrangement is appropriate for a book which aims to serve as a standard reference work for all those concerned with reproduction. This necessarily results in a somewhat catalogue-like presentation at times, but this is mitigated by the stress laid on comparative aspects. Chapters 2, 4 and 5 are particularly good in this respect by virtue of skilful introduction of general principles before a taxonomological amplification of details. Chapter 3 shows this list-like character most, and its readability is further decreased, at least for the non-zoologist, by an insufficient use of vernacular names, although elsewhere in the book both Latin and common names are given in full.

It is possible that some veterinary readers may be disappointed in that the space devoted to the various species and orders is proportional to existing knowledge and to scientific interest rather than to clinical and economic application. Thus in chapter 4 the bat rightly receives greater attention than the dog. However, the accounts pertaining to domesticated species are in no way

deficient and represent the most complete and pertinent reviews available to-day. The book will form an essential reference work for teachers and advanced students and also for those who are daily concerned with scientific investigations of reproduction. It will have less immediate usefulness to those whose interests are strictly applied. Its value is greatly enhanced by subject and author indexes, and extensive bibliographies. The quality of the paper is far higher than in the 1952 volume so that the print and, more important, the many illustrations, are excellent.

—R. J. FITZPATRICK.

BOOKS RECEIVED

[Notice of recently received books in this list does not preclude review.]

BINDRICH, H. (1956). Über Infektionskrankheiten der Edelpelztiere. **[Infectious diseases of fur-bearing animals.]** pp. 20. Berlin (& Leipzig): Hermelin-Verlag Dr. Paul Schöps. DM 2.

VON BUDDENBROCK, W. (1956). Vergleichende Physiologie. Band III. Ernährung, Wasserhaushalt und Mineralhaushalt der Tiere. **[Comparative physiology. III. Nutrition, water metabolism and mineral metabolism of animals.]** pp. 677. Basle (& Stuttgart): Birkhäuser. DM 66.

BURNET, F. M. (1956). **Enzyme antigen and virus. A study of macromolecular pattern in action.** pp. viii + 193. Cambridge: University Press. 18s.

HAMMOND, J. (Edited by) (1957). **Progress in the physiology of farm animals. Volume 3.** pp. 741-1043. London: Butterworths Scientific Publications. 50s.

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